THE CULTIVATOR:

A MONTHLY PUBLICATION, DEVOTED TO AGRICULTURE.

I KNOW OF NO PURSUIT IN WHICH MORE REAL AND IMPORTANT SERVICES CAN BE RENDERED TO ANY COUNTRY, THAN BY IMPROVING ITS AGRICULTURE.—*Wash.*

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THE CULTIVATOR.

TO IMPROVE THE SOIL AND THE MIND.

Hints for July.

From a belief of its utility, confirmed by several years' practice, we earnestly recommend a trial, to those who have not adopted the practice, *of curing their clover hay, and such as abounds in clover,* IN GRASS COCKS, instead of spreading and curing it in the old way. It will save labor, save hay, and add much to the value of that which is housed. As soon as the grass has become wilted in the swath, and the external moisture evaporated, and by all means before any of the leaves become dry and crumble, put the grass in grass cocks, as small at the base as possible, not to exceed a yard in diameter, and taper them off, by adding forkfulls, to the apex, which may be four to five feet from the ground. Leave them undisturbed at least 48 hours, and until you are pretty certain of sun or a drying wind; then open the cocks, and if once turned, the curing will be complete in three or four hours, scarcely a leaf will be wasted, and the hay will be bright, fragrant, and will keep well.

Cut small grain before it becomes dead ripe, for the following reasons: 1. If omitted, bad weather may intervene and delay the harvest too long. 2. Dead ripe grain wastes much in harvesting. 3. Early cut grain makes the best flour. 4. When any portion of the culm or straw has ripened, or become dry, there is no further supply of nourishment from the soil; and the grain then gets as much food from the cut as it could get from the standing straw. Hence, when the straw turns yellow under the ear, however green the rest part of it may be, the grain should be cut. And when the straw becomes badly affected with rust or mildew, the sooner it is cut the better.

Do not put the plough into your corn, if you have, as you may have for a trifle, a cultivator or horse-hoe. It severs the roots, which are the mouths of the plants, turns up and wastes the manure, which should always be applied to this crop, and deprives the plants of more than half their pasture. *Hill your corn but stightly.* Hilling renders it more liable to suffer from drought, and induces it to throw out a new set of roots, the old ones being in a manner useless, by being buried too deep, and beyond the reach of the influence of heat and air, the indispensable agents of nutrition and vegetable growth.

Rural Embellishment.

There are few things better calculated to attach us to our HOMES,—where the social virtues love to congregate, and to dispense their blessings—than rural embellishments. This is true whether we apply the term to our neighborhood or individual abode.—The public grounds about the great cities of the old continent, some of which comprise an area of five hundred acres, are the theme of general admiration, the theatres of healthful exercise and recreation, and the sources of high intellectual enjoyment. The lesser towns and villages, even of our own country, owe more of their charm and interest to the trees and plants which embellish their squares, streets and grounds, in the eye of a man of taste, than to any ostentatious show of brick and mortar—more to the beauties of nature than to the works of man. Nay, the highest efforts of the human intellect are in vain put in requisition to imitate the handy-works of the Creator. And when we come down to the suburban residence, and even to the unostentatious abode of the farmer, how are their beauties heightened, and their value enhanced, by a screen of ornamental trees, and a well kept garden.

Loudon tells us, that in travelling from Strasburgh to Munich, he passed through a continued avenue of fruit and forest trees, planted on both sides of the highway, for more than one hundred miles. Who that has passed through New-England, in summer, has not admired, in some of the villages, the beautiful trees with which they are in a measure enshrouded. The great objection to planting is, that one may not live to enjoy the fruit or the shade of the trees which he plants. Such an objection is unworthy of the age, which should, if it does not, have regard to the interests of the human family, and of posterity,—and is, besides, affecting to hold a shorter tenure of life than all of us hope for, and most of us expect.—Twenty years ago, at forty years of age, we commenced the cultivation of what was termed a barren untameable common, not an acre of which had been cultivated, and on which neither a tree nor shrub had ever been planted by the hand of man. We have now growing in our court yard, comprising about half an acre, and in the highway in front of it, fifty species of forest and ornamental trees, many of them forty and fifty feet high, more than fifty speices of ornamental shrubs, not including the rose, besides a vast number of bulbous and herbaceous ornamental and flowering perennial plants—the greatest number of which, in all their variety and hue of foliage, flowers and fruit, may be embraced in a single view from the piazza. Most of our fruits have been raised by us from the seed, or propagated by grafting or budding. Yet we can enumerate more than two hundred kinds, including varieties, which we are now in the habit of gathering annually from trees, vines, &c. of our own planting. We feel grateful to God for these rich and abundant blessings, and for the impulse which prompted our labor. We have adduced our own example, not in a spirit of vaunting, but to convince the young and the middle aged, that there is abundant reason for them to plant, with the hope of enjoying the fruits of their labor. The old *should* plant, as an obligation they owe to society, and for the requital of which they have but a short period allowed them.

Our attention has been particularly drawn to this subject at the present inapposite season, by reading the report and constitution of the Bangor association, termed the Ornamental Tree Society, which has been recently formed, and whose object is the embellishment of their city by planting out forest trees. The constitution requires, that "every member shall himself set out, or cause to be set out, one or more ornamental trees, on such of the public streets or squares of the city as he may elect"—the kind of tree, and distance of planting, to be determined by the directors. Accompanying the report, in the New-England Farmer, are two letters from Gen. Dearborn, on ornamental planting, evincing much experience and good taste in the matter.

The General considers the planting of only one kind of tree as evincing a bad taste.

"The monotony of appearance, which lines, or clumps, of the same tree produce, is to be avoided, and a picturesque and agreeable aspect obtained, by increasing the varieties; for as the periods of their foliation are so very different, as well as the tints of green when in vegetation, and the remarkable autumnal changes quite as dissimilar, they are presenting an ever varying, yet always pleasing and interesting scene. Besides, we have so many magnificent species of native trees, which flourish luxuriantly, even in the most exposed situations, that I have never been able to divine, why one particular tree should be so universally selected, as shades, or for ornament, not only around private dwellings, but for all public places. As well might all flowers be excluded from our gardens, but the rose, or the lilac, and all fruits from our orchards but the apple."

"For your streets I recommend the alternate planting out of rock maples, elms, white ash, white maple, basswood, beech, and red, white and other oaks. [We will add to the list of native trees the button wood, tulip tree, or whitewood, and cucumber tree, *(magnolia accuminata,)* for the city and village, and the black walnut, butternut and honey locust for the country.]—The rock maple is certainly one of our most superb trees, and in my own estimation superior to the elm.—Its form and foliage, with the splendid changes of its autumnal aspect, are of surpassing beauty. The basswood, *(Tillia Americana,)* is the American linden, or lime, and much superior, for its size, graceful form, and large leaves, to the much celebrated and favorite European species. It is easy to transplant, and of rapid growth. The oaks are of rapid growth, and one renowned as the name of England, and have been the choice trees of all the celebrated nations of antiquity. The occidental plane, or American buttonwood, is also a finer tree than the oriental variety, which was so much admired and cultivated by the Asiatics and Romans."

For public grounds and squares, the General recommends, also, the white pine, cedar, hemlock, spruce, and we would add the fir, the larch, and a sprinkling of foreign trees, as the English and Scotch elms, larch, abeel, horse chesnut, mountain ash, &c. which may be obtained at the nurseries. He recommends the spring as the best season for transplanting in New-England; that the roots be taken up as entire as possible; that the trees be *not more than two inches in diameter;* that the tops be not cut or mutilated.—"*Do not,*" says he, "*cut off a single twig,* save such as may be within four or five feet of the ground."—He also directs that large and deep holes be made for the reception of the trees, and that these holes be filled with the best mould, to be well trod down and watered after the tree is planted. In regard to coniferous and other evergreens, Gen. Dearborn recommends, that they be taken from open grounds—(nurseries are the best,)—all the limbs carefully preserved, and as much of the dirt about the roots retained as possible. "The best time," he continues, "to transplant all the evergreen trees is later than that for the decideous, and is *just before they commence vegation.*" These directions are all good; yet we would amend, or rather add, to the one which regards the *time* for transplanting evergreens. We transplant them *just after vegetation has commenced*—have transplanted in July, with entire success—and our friend Michael Floy, of New-York, a professional nurseryman, prefers the month of August. He showed us the other day, several large firs, which had been planted at that season, in front of his grounds at Harlem, all of which lived and did well. We think evergreens should be planted *when the tree is growing*—as the foliage requires a constant supply of nourishment through the roots; and if the functions of these are dormant, as they are likely to be when evergreens are transplanted when vegetation is at rest, the foliage is apt to wither, and the plant to die: and the only danger to be feared from transplanting these trees at midsummer, is that which arises from excessive evaporation. To guard against this, as much earth should be lifted with the roots as is practicable,—the holes for their reception should be large and deep, filled to the proper height for the roots of the tree with loose mould, and well saturated with water; the surface around the tree should be well mulched with litter, and this well wet, and superficially covered with earth, and the plants occasionally watered if the weather is hot and dry.

As to the effect of planting, *upon the beauty of the landscape,* Mr. A. J. Downing, in a well written article upon this subject, justly remarks—

"Many a dreary and barren prospect may be rendered interesting—many a natural or artificial deformity hidden, and the effects of almost every landscape may be improved, simply by the judicious employment of trees. The most fertile countries would appear but a desert without them, and the most picturesque scenery in every part of the globe has owed to them its highest charm. Added to this, by recent improvements in the art of transplanting, the ornamental planter of the present day may realize, almost immediately, what was formerly the slow and regular production of years."

Mr. Downing is about to publish a work on our forest trees, and ornamental planting, a task for which he is eminently qualified, by good taste, science and practical knowledge.

As to the effect of planting and gardening, *upon the body and mind* of those who engage in these pursuits, we offer the following extracts from Loudon's Suburban Gardener, and we recommend them to the special notice of all gentlemen who are troubled with dyspeptic or hypochondriac affections.

"There is," says our author, "a great deal of enjoyment to be derived, from performing the different operations of gardening, independently of the health resulting from this kind of exercise. To labor for the sake of arriving at a result, and to be successful in attaining it, are, as cause and effect, attended by a certain degree of satisfaction to the mind, however simple or rude the labor may be, and however unimportant the result obtained. To be convinced of this, we have only to imagine ourselves to be employed in any labor from which no result ensues, but that of fatiguing the body, or wearying the mind: the turning of a wheel, for example, that is connected with no machinery; or, if con

nected, effects no useful purpose; the carrying a weight from one point to another and back again; or the taking a walk without any object in view, but the negative one of preserving health. Thus it is not only a condition of our nature, that in order to secure health we must labor; but we must also labor in such a way as to produce something useful or agreeable. Now of the different kinds of useful things produced by labor, those things surely which are living beings, and which grow and undergo changes before our eyes, must be more productive of enjoyment than such as are mere brute matter—the kind of labor and other circumstances being the same. Hence, a man who plants a tree, a hedge, or sows a grass-plat in his garden, lays a more certain foundation for enjoyment, than he who builds a wall or lays down a gravel walk; and hence the enjoyment of a citizen, whose recreation, at his suburban residence, consists in working in his garden, must be higher in the scale, than that of him who amuses himself in the plot round his house, with shooting at a mark, or playing at bowles."

A strong illustration of this truth lately came within our knowledge. An esteemed friend, who had become wealthy and retired from active business, at the middle age of life, had become particularly diseased in body and mind. We advised him to recreate himself in horticultural pursuits, as an antidote to both maladies. He replied, that he had no taste, and could not acquire a relish for these pursuits. We thought otherwise; and as he was going to spend the summer with a relative, on a farm which belonged to him, we presented him with half a dozen trees, asked him to plant them on his farm and to report to us in autumn, whether they had afforded him any gratification. When he returned from his summer residence, he confessed with gratitude, that they had been to him a source of high interest and gratification; that they had received his constant care and attention; that the had watched, with a kind of paternal feeling, the development of the leaves, and the growth of the branches; that he had examined them almost daily, sedulously guarded them from injury, and watered them with his hand; and that these cares and labors afforded pleasures without alloy. Had our regretted friend made this experiment two years earlier, he would, in all probability, have been now numbered among the living, and probably among the hale and hearty.

But to return to our quotations from Mr. Loudon—

"One of the greatest of all the sources of enjoyment resulting from the possession of a garden," remarks our author, "is the endless variety which it produces, either by the perpetual progress of vegetation which is going forward in it to maturity, dormancy or decay, or by the almost innumerable kinds of plants which may be raised in even the smallest garden. Even the same trees, grown in the same garden, are undergoing perpetual changes throughout the year; and trees change also in every succeeding year relatively to that which is past; because they become larger and larger as they advance in age, and acquire more and more their characteristic and mature form." "Independently of the variety of change resulting from the variety of plants cultivated, every month throughout the year has its particular operations and its products: nay, it would not be too much to say, that during six months of the year, a change takes place, and is perceptible in the plants of a garden, every day; and every day has in consequence its operations and its products."

In conclusion: A bountiful Providence has given the vegetable kingdom for our sustenance, employment and highest intellectual enjoyment,—and has scattered these elements of happiness, with a profuse hand, every where within our reach. It is left with us to enjoy them in a greater or less degree, as we learn to appreciate their value, and exert ourselves to apply them to their proper use. The brute is content to satisfy its animal wants. Man, the lord of the creation, should have a higher aim—because he has higher sources of enjoyment than the brute, and higher duties to perform—he is the husbandman appointed to take care of and nurture the great vineyard, and to carry out the wise purposes of the all-bountiful Giver.

We intend, ere long, to name and describe some of the ornamental shrubbery, and perhaps perennial plants, best adapted for the embellishment of court yards and gardens. In the mean time we advise the young to cultivate a taste for rural embellishment, as a preventive of bad habits, and as the source of substantial and innocent pleasure.

Liquid Manures.

All urine, says Davy, contains the essential elements of vegetables in a state of solution, that is, in a condition immediately to become the food of plants. The Flemings and Chinese save and apply all this fertilizing material, either mixed with earths or dung, or in a liquid form, diluting it first with water. Three hundred acres are kept in a condition of great fertility by the liquids which flow from a part of the drains of the city of Edinburgh. The meadows thus fertilized, says Mr. Oliver, let for £24 to £30 per imperial acre per annum, equal to $106 to $136! and in one case, in 1826, the Earl of Moray's meadow fetched £57 an acre!! Some of these lands were, till lately, absolutely barren—sea-sand—and yielding nothing. Thirty acres were levelled and prepared to be irrigated by the liquid filth of the town, in 1821. They now let for £15 to £20 per acre, and are considered susceptible of much higher improvement.—The great value of liquid manure is particularly illustrated in the following quotation which we make from the veteran in horticulture, Mr. Knight.

"I have shown in a former communication," says this distinguished physiologist, "that a seedling plum stalk, growing in a small pot, attained the height of nine feet seven in a single season; which is, I believe, a much greater height than any seedling of that tree was ever known to attain in the open soil. But the quantity of earth, which a small pot contains, soon becomes exhausted relatively to one kind of plant, though it may still be fertile relatively to others; and the size of the pot cannot be changed sufficiently often to remedy this loss of fertility; and if it were ever so frequently changed, the mass of mould, which each emission of young roots would enclose, must remain the same. Manure, therefore, can probably be most beneficially given in a purely liquid state; and the quantity which trees growing in pots have thus taken, under my care, without any injury, and with the greatest good effect, has much exceeded every expectation I had formed.

"I have for some years appropriated a forcing house at Downton, to the purposes of experiment solely upon fruit-trees, which, as I have frequent occasion to change the subjects on which I have to operate, are confined in pots. These at first were supplied with water, in which about one-tenth by measure of the dung of pigeons or domestic poultry had been infused; and the quantity of these substances, generally the latter, was increased from one-tenth to one-fourth. The water, after standing forty-eight hours, acquired a colour considerably deeper than that of porter, and in this state it was drawn off clear, and employed to feed trees of the vine, the mulberry, the peach, and other plants; a second quantity of water was then applied, and afterwards used in the same manner, when the manure was changed, and the same process repeated.

"The vine and the mulberry tree being very gross feeders, were not likely to be soon injured by this treatment; but I expected the peach tree, which is often greatly injured by an excess of manure in a solid state, to give early indications of being over fed. Contrary, however, to my expectations, the peach tree maintained, at the end of two years, the most healthy and luxuriant growth imaginable, and produced fruit in the last season in greater perfection than I had ever previously been able to obtain from it. Some seedling plants had then acquired, at eighteen months old, though the whole of their roots had then been confined to half a square foot of mould, more than eleven feet in height, with numerous branches, and have afforded a most abundant and vigorous blossom in the present spring, which has set remarkably well; and those trees which had been most abundantly supplied with manure, have displayed the greatest degree of health and luxuriance. A single orange tree was subjected to the same mode of treatment, and grew with equal comparative vigor, and appeared to be as much benefitted by abundance of food, as even the vine and the mulberry tree."

To introduce a comparison between the animal and vegetable, we may compare the roots of the latter to the locomotive power of the former, which enables both to *go abroad for food*—constantly to seek new pasture; and the liquid food of the plant to the chyle in the animal stomach—fitted to nourish and become an integral part of the living organic structure. So that liquid food is more readily converted into vegetable matter, than forage and grain is into the flesh of the animal. And the continued extension of the roots is superseded by giving to the plant this cooked food, in the same way that the locomotive power of the ox is superseded by feeding him constantly at the stall.

The above facts may be rendered profitable to the professional gardener, as they suggest a source of immediate fertility always at his command. They will not fail to indicate to the fair, who mourn at the declining beauty of their parlor plants, a ready means of renovating and imparting to them new vigor. The farmer who has hitherto disregarded his liquid manures, and who has suffered to go to waste, the highly fertilizing matters of his dove-cote and poultry-house, will see, at once, from the preceding statement, that he has lost a treasure to his land from his neglect; and if he is not unchangeably wedded to his old habits, he will at once set about availing himself of these valuable sources of fertility.

A weak solution of soda, (one pound in fourteen gallons,) produces upon soils, (says the Sussex Agricultural Express,) the most admirable fertilizing effects.

Mr. Coleman's Agricultural Report.

We regret that our limits do not permit us to extract liberally from this excellent report; but we are obliged to be content with a brief notice of its principal points. We cannot withhold our admiration of a people who by industry and perseverance, have maintained a high reputation as agriculturists, educated large families, and surrounded themselves with the substantial comforts of life, upon a rocky primitive soil, "no part of which can be advantageously cultivated without manure." The farmers of Essex are richly entitled to this commendation; and yet we consider their husbandry defective in many points, and capable, with their habits of application and close observation, of being doubled or trebled in product. But we resume the thread of the report. The next subject in order, is

Fruit Trees—which are cultivated to a considerable extent, and are a source of profit. The trees of one of their best apples, the Baldwin, were principally destroyed by the severe winter of 1833-4; yet in ordinary years the farmer markets 300 barrels of dessert apples. They are hand-picked, packed in dry barrels, placed in a cool cellar, and not generally sold till May. Eight hundred dollars a year, says the commissioner, is not an unusual product of his orchard. These facts present a strong inducement for the cultivation of orchards; and if we superadd the consideration, that apples are now made to constitute a valuable food for all kinds of farm stock, the orchard cannot fail to be regarded as a source of great and certain profit to the farmer. The commissioner notices a new mode of keeping the apple trees free from the canker worm, which until lately has much annoyed them. It is to surround the collar of the tree, or that part which is at the surface of the ground, with a belt of adhesive clay, and then to cover this with tar—the application of tar directly to the trunk of the tree having been found to be injurious.

We cannot pass over the subject of fruit, without paying a merited compliment to one of the inhabitants of Essex, who has distinguished himself as a pomologist—Robert Manning, Esq. of Salem. Mr. Manning has been indefatigable for years, in collecting the best fruits from European and American nurseries, in cultivating, comparing and testing their relative qualities; and he has just published the result of his labors in a work upon fruits, which is highly spoken of, though we have not yet met with it. A choice selection of orchard and garden fruits, adapted to our climates, is a desideratum with all who know how to appreciate the relative value of those kinds which are intrinsically good.

"A taste for flowers,"—we resume our quotations from the report—"and the external rural embellishments of the houses and grounds, is every where springing up. Besides its strong tendency to multiply the attachments to home, among the best safeguards of virtue, and furnishing sources of delightful recreation, it is highly conducive to intellectual and moral improvement."

To preserve plum trees from being destroyed by what is termed the black canker, Mr. C. mentions the successful mode adopted by the Rev. Mr. Perry, and which we have practised for twenty years. It is to cut off all the affected parts, and immediately to consign them to the fire.

Forest Trees.—The commissioner very properly directs the attention of the farmer, to this subject, and cites several cases to show that the growth of forest trees is a profitable appropriation of land—in one case, an acre yielding 60 cords of wood, the growth of 25 years—worth, on delivery, $5 per cord, or $300 for the 25 years—being $12 per acre per ann. Planting forest trees has but commenced in Essex. Among the trees named as springing up, we presume spontaneously, are the white and yellow pine, white birch, &c. Among the cultivated trees, the locust, Scotch fir, and oak are named, and we venture to recommend the white ash and soft maple—the former for dry, and the latter for moist soils, in addition.—The seeds may be readily gathered in quantities at proper seasons; they vegetate freely; their growth is rapid, and they are excellent for firewood and timber, far superior to the white birch.

Fences are principally of stone. The commissioner suggests, that to prevent their being thrown by frosts, as they are apt to be when laid in a trench, that gutters be made on each side of the wall, at a short distance from it, by which all the surface water which would otherwise settle under it, should be immediately conveyed away.

The *Farm Buildings* are generally of wood. The commissioner recommends stone for buildings, with which the country abounds. The approved mode of constructing barns on the slope of a hill, giving the basement for manure and vegetables, and the second story for hay, grain and cattle, is beginning to be followed. Much benefit is supposed to result to the manure by keeping it from the weather.

Slaughter-house offal, is bought by the managers of the poor-house, at 32 cents for every beef killed, and so husbanded as to be rendered profitable to the establishment. The meat from the head is consumed by the inmates; the heads are then boiled for the extraction of the tallow, and thrown to swine; and after being thoroughly picked, they are sold for animal carbon; the jaw and leg bones are sold to the button

maker, the claws of the hoof to the comb maker, the skins from the legs to the glue maker; and from the feet is extracted oil. Hogs are fattened, and manure made in the bargain.

Extensive beds of *peat* exist in Essex; much is used for fuel, and sells ordinarily at $8 per cord. A stratum of two feet in thickness, gives 480 cords to the acre.

Great *improvements* have been made and are making, in dykeing salt marsh, and reclaiming fresh water swamps. The prevailing opinion seems to be in favor of draining, though some are content with mere ditching salt marshes. By the former, the product in hay has been threbled. Breaking up of the old sod is considered injurious; yet grass seeds are sown upon it, and stable manure is sometimes applied with advantage. The swamps are reclaimed first by draining, and then by carting on gravel or sand, and sometimes stable or other dung, mixing these with the muck, and sowing oats and grass seeds. Some of these reclaimed swamps are now considered worth $100 per acre. So far as we can perceive, the excellent plan of under-draining has not yet been introduced—the drains being a main one in the centre, and lateral ones running from it to the borders of the swamp. We think this latter branch of Essex farming is capable of being greatly improved by a better system of draining, and by applying the vegetable matter of the swamps as a fertilizing material to the uplands. An extraordinary instance of improvement is noted upon Cape Ann. A district of 584 acres, which forty years ago exhibited only swamps, "frowning hills of granite, and rolling boulders," which was not capable of keeping a cow, without procuring hay for her support, from a distance of several miles, has been reclaimed, improved, and made to produce as follows:

Hay,.....	854	tons.
Indian corn, ...	690	bushels.
Rye,.....	390	do
Oats,.....	130	do
Potatoes, ...	8,635	do

The mowing land is valued at $300 per acre, because, says the commissioner, it will pay a handsome profit upon that price.

We must close our notice of this excellent report, without adverting to many facts which we should be glad to promulgate. Yet before we dismiss it, we must remonstrate against a custom which has obtained "down east," and which the commissioner has endorsed by adopting in his report—of attaching the significant term *English*, to products which are no more English, in any sense, than they are American or French. Thus they speak of *English* meadow, comprising grasses that are indigenous to the United States; of *English* grain and *English* turnips; of *English* cherries, and of *English* strawberries, which came originally from our continent. The distinctive term, thus applied, may be very well understood *at home*, though we confess, Yankee as we be, we are often much puzzled to *guess* at precisely what it means. The application of it is not, however, conformable to the language of science, or to the spirit of an improving age, and we think it should be discarded at least by those who write for a nation and for posterity.

The Philosophy of Deep Ploughing.

Our best farmers concur in opinion, as the result of their experience, that most soils are improved by ploughing them *deep* during a course of crops, or once in four or five years. We propose to state some of the reasons which present in favor of this practice. And

First. Occasional deep ploughing brings to the surface the fine vegetable matters of the soil, which we all know, constitute its fertility, or the food of our farm crops, and which, by the operations of tillage, and the force of rains, have sunk upon or into the subsoil. These matters, while deeply buried, are inert, and afford no support to our crops; but brought within the influence of the sun and atmosphere, and within reach of the roots of our crops, by deep ploughing, or the subsoil plough, they are rendered soluble, and made to exert their potent energy upon vegetation—they are fitted for the absorbent vessels of plants, and to become integral parts of them.

In the second place, a deep tilth enlarges the pasture of plants—it permits the roots to roam more freely and extensively in search of food—it permits the surplus water to escape*—and it counteracts the influence of drought. A superficial tilth is much sooner exhausted of its moisture, by the influence of the sun, than a deep one.

And in the third place, its benefits are manifest by the increased product which it gives—these being proportioned, in a measure, to the depth of tilth, when this depth does not exceed ten or twelve inches. See our quotation from Von Thaer, in the second number of our current volume.

Science has furnished other reasons for the practice of occasionally ploughing deep, or rather explained to us the causes of results which were before palpable. Vegetable matters are only available as the food of plants in a soluble state, that is, when they are capable of being dissolved by the liquids of the soil. When deeply buried, these matters are often not soluble; but if brought within the influence of the air, and heat, they soon become soluble, are carried by the liquids in which they are dissolved into the absorbent vessels, and assimilate with the plant. "Soluble geine," that is, decomposed organic, or animal and vegetable matter, says Dr. Dana, "is the food of plants. Insoluble geine becomes food by air and moisture. Hence the reason and result of tillage." Earths, taken from depths so far below the surface as to exclude the agency of heat and air, often abound in insoluble geine, and indeed in the seeds of plants, have, when submitted to a temporary exposure upon the surface, developed uncommon fertility, and seeds have been found to grow. The subsoil plough, which opens to atmospheric and solar influence the long hidden treasures of the earth—its insoluble geine—is a new and important implement for developing the bounties of Providence. It is perhaps preferable to trenching with the spade or plough, inasmuch as the lower stratum is not blended with the upper one, until the air and moisture have imparted to it fertilizing properties—until they have converted its insoluble, into soluble geine. There is reason to believe, that in the great secondary formation of the west, the earth, to a great depth, filled as it is with organic remains, would be found to be fertile upon its exposure to the atmosphere.

These principles, which we have endeavored to explain, serve also to illustrate the advantages of alternating tillage with grass crops—of occasionally opening with the plough, to atmospheric and solar influence, the inert vegetable matters—the insoluble geine—of dividing, pulverizing and mixing the soil, thereby giving a free range to the roots, and counteracting the influence of drought.

We all know, that land will wear out under a constant system of cropping, unless more highly and constantly manured than is consistent with farm economy. It is equally apparent that most meadows require to be top-dressed at least once in three years, to prevent deterioration. Well managed young meadows should give at least three tons of hay to the acre; yet after the second or third year they will deteriorate, if not top-dressed, until they yield but one or two tons the acre. Besides, if manure is applied, as it ought to be, in an unfermented state, and to an autumn-ripening corn or root crop, it will yield twice the benefit to a farm, that it will if spread upon the surface of the soil.

The considerations which we have suggested go to show the propriety of occasionally ploughing *deep* in tillage husbandry, and of alternating grain, grass and root crops wherever the nature of the soil and surface will admit the plough.

* Of this, we have the best proof: one piece of our land, when we began to improve it, was, in wet times, covered with water, which remained there often days and weeks. Since it has been tilled deep, the water never stands an hour upon the surface, except the soil is frozen.

Vitality of Seeds.

The following remarkable fact, showing the long retention of vitality in seeds when lying upon the ground, has been related to us by Judge Stilwell, of St. Lawrence, as having taken place in his immediate neighborhood and under his own personal observation. Twenty-one years ago, a neighbor cleared and burnt a piece of ground, and harrowed in grass seeds and turnips. The ground lay 12 years in meadow, and 8 years in pasture, when the plough was put into it for the first time, preparatory for a tillage crop. It was soon discovered, after the soil had been turned over, that it promised a crop of turnips, which must have come from seed grown upon the ground nineteen years before, many of the roots having been then left in the ground over winter, and suffered to seed. A part of the plants were left to grow, and came to high perfection.

Theory and Practice.

Mr. Stevenson, the able conductor of the Franklin Ky. Farmer, has commented, at some length, upon our article in the April Cultivator, "*The new lands of Kentucky wearing out;*" and we are very happy to perceive, that in the main, there are no essential points of difference in our opinions. We made the quotation from his paper, not so much to give the character of Kentucky farming, much of which, we are aware, is excellent, but to show that, under bad management—under *common* management—the best lands will soon become poor; and while we concede all the advantages which he claims from science, we must persist in the opinion, that neither the mere theorist, nor the mere practitioner, are so likely to succeed, in profitable husbandry, as the man who possesses both a theoretical and practical knowledge of the business. We have no schools that combine the two requisites; and hence we suggested the propriety of practical farmers instructing themselves in the science.

Account Current.

Thrifty farmers are in the habit of making out a balance sheet for each year, in order to ascertain what they have made or lost by their farming operations, and with a view to profit from their errors.—Now Uncle Sam is at least nominally a farmer, and, like all other farmers, can only expect to prosper in proportion as his sales exceed his purchases; and, at all events, if we find that he has not raised his own provisions, we may set it down as certain, that he does not work it right, and that unless he mends his ways, he must ultimately fail. The business of this nation, to be independent and prosperous, should be to provide breadstuffs, not only for its own population, but a surplus, sufficient to pay for the foreign commodities which we consume. Such would be the course of the prudent farmer; and we should think little of the shoemaker, or the hatter, who should be obliged to buy shoes or hats for his family.

In striking the balance of Uncle Sam's account, we would premise, that our estimates embrace only breadstuffs, the great staples of the northern and middle states, and which constitute the principal means, in these states, of paying for the foreign merchandize which we consume.

By a statement from the treasury department, it appears, that the importations and exportations of grain, flour and meal, during the year 1837, were as under stated, estimated in dollars.

Articles.	*Imported.*	*Exported.*
Flour,.....	$122,691	$2,987,269
Wheat, ...	4,154,325	27,206
Rye and rye meal, ...	333,695	165,467
Corn and meal,.....	3,918	911,634
Other grain. bread, &c. ..	8,837	325,077
	$4,623,466	$3,416,653
Deduct exports, ...	3,416,653	
Bal. against Uncle Sam,..	$1,206,813	

in the commodities which it is his business to raise and sell, and which he never ought to be obliged to buy.

If we add to this balance of.....	$1,206,813
the amount which the old gentleman paid last year for foreign silks, viz.....	14,352,823
and for foreign sugar,.....	12,514,504
It will show an annual balance against him, of.....	28,074,140

Twenty-eight millions of dollars, in articles which it is either his professed business to raise, or which he can produce by his own labor, and from his own soil. This balance would however be reduced by the value of the silk and sugar which he exported in 1837, to about twenty millions of dollars. If these facts were applied to the affairs of an individual farmer, we should naturally suppose that his boys were either too proud or to lazy to work, and perhaps both. And wherein does the analogy fail between an individual farmer and a nation of farmers. A diminution of crops was among the causes of the late national embarrassments; and our surplus products have been relied upon to pay the foreign balances against us.

What would be the conduct of the individual farmer who should find his affairs thus going to ruin! Would he not instruct his boys in the science and practice of his business, and stimulate them to labor, by rewards, that the farm might produce enough and to spare, to pay off his debts, and keep something on hand for a wet day! And if such would be the politic course in the manager of a farm, why would it not be wise in the managers of a state, or of a nation! They give millions annually to aid those who add nothing to our national wealth, and which tend to elevate the idler above the man of industry! Why not give for instructing the farmer and mechanic how to double the profits of their labor! We insist, that the higher branches of learning, when blended with practical instruction in the useful arts, and particularly in the business of agriculture, are more profitable to a state, than they are when applied to the learned professions.

Advantages of Draining.

Make your lands dry, if not the first, is the second precept in good farming. We have many thousands of acres of swamp lands, scattered over our country, which are rich in the elements of fertility, and which would yield them readily to our use, if freed from their surplus water. We have other vast tracts, which have been subjected to the control of the plough, but which make a scanty and precarious return, by reason of their level surface, and the water which settles and remains upon their impervious sub-

soil. Most of these lands are susceptible of a high state of improvement and of profitable culture, by the simple process of draining, a branch of farm economy which has been neither much practised nor duly appreciated in this, nor, till recently, in those countries of Europe from whence we derive our best lessons in farming. Indeed we think it is but imperfectly, or partially, yet practised in England; and we should rather refer to Scotch husbandry for the best examples in this branch of improvement.

We are aware, that many think, as we did when we *commenced* draining, that they understand all about it, and that they practise it on the most approved, or at least most economical system. But they may learn, as we have learnt by experience, that draining is only economically done when it is *well* done—when the lands are laid dry, and the drains so constructed as to be rendered efficient and permanent. In swamps, the source of the evil,—the fountain of living waters, which flow into the morass, must be sought out, and the waters conducted off before they enter the swamp, or before they approach its surface. On level tenacious soils, or soils reposing on an impervious subsoil, where the rain and snow water settles and stagnates, and where its existence, is generally indicated by the growth of coarse grass, or marsh plants, *furrow* draining must be resorted to, that is, parallel drains must be opened, in a moderately inclined direction across the field, to receive these waters as they settle down, and to free the soil from their incumbrance.

We have published our own opinion, and the opinions of others, repeatedly, as to the best manner of constructing drains—of the materials which are most suitable for making them, and of the situations where under drains are preferable to open ones. The expense of thorough draining seems formidable; but yet, if it is compared with the enhanced value of the land operated upon, and its vastly increased products, it will be seen that the outlay is better than capital at compound interest. If the outlay in draining will nett a return of only seven per cent in the increase of product, it should be gone into; but in almost every case where the operations are judiciously and thoroughly performed, the return in the increased value and products of the land, is generally twice or thrice this sum, and often fifty and a hundred per cent.

We present below a statement of the mode and advantages of improving a wet meadow, in a communication addressed to the trustees of the Essex agricultural society. The writer stated to the trustees, that the whole cost of the land and improvements, up to the time of taking off the first crop, did not exceed $26 per acre; and yet a part of it afterwards produced, in one year, the sum of $100.50 per acre. The communication which we insert below, is accompanied, in the New-England Farmer, by one from Moses French, giving his mode of reclaiming six or seven acres of swamp land, covered with "bushes, flags and rushes," for which he paid $70, and for which he refused $200 after he had made his improvement. But to the statement.

" To the Trustees of the Agricultural Society of the county of Essex.

"GENTLEMEN—In my farm in Lynn, I have a meadow of 70 acres, which eight years ago bore nothing but meadow hay, and produced about one ton to the acre, of a poor quality. The meadow was mostly filled with hassocs. I cut a ditch of eight feet wide and four feet deep, through the centre of the meadow, and many other smaller ditches to drain the water into the large ditch. The length of all the ditches is about four miles. The whole meadow is covered by a soft black mould, from six to nine inches, and then a greyish substance, I call peat, from nine to fifteen inches deep, upon a pan of clay and sand.

"Eight years ago the last fall, I ploughed seven acres of this meadow, and in the following spring I sowed three acres with oats, three and a half to four bushels, half a bushel and one peck red top and one pound clover seed to the acre. In the summer following, I harvested fifty bushels of oats to the acre. In the winter following, when the ground was frozen, I carried on ten cords of compost manure to the acre. This compost contained two cords of night manure, four cords of yellow loam, and four cords of gravel, and was spread evenly over the ground in the spring, as soon as the frost was out. The following summer I cut on an average, three tons to the acre, of good, merchantable English hay. The following year the seven acres produced two and a half tons to the acre, and the third year two tons to the acre. The winter after the third cutting, I top dressed the same land with the like compost, ten cords to the acre. The next year the grass was equally good as the first year's mowing, but decreased in quantity the two following years, in the same ratio as at the first manuring.

Two years after my experiment upon the seven acres, I went over about three acres of the same meadow, while frozen, and cut off all the hassocs, so as to leave the ground smooth, and hauled off the hassocs. In the winter I carried on to the land, ten cords to the acre, of manure from the slaughter house yard, where I kept eight or ten hogs. Early in the spring, this manure was well spread upon the land, and I then sowed to the acre the like kind and the same quantity of grass seed as I did on the seven acres. The following summer I mowed the three acres twice. On one acre which I measured, and about as good as any of the three, I cut the first time three tons of hay, which I sold at $25 the ton, the second cutting one and a half ton, which sold at $17. The whole quantity of hay upon one acre that year, amounted to $100.50. The second year I had an equally good crop on this land as the first, but I did not cut the second crop. The third year the crop decreased, as the crop of the third year upon the seven acres. The winter after the third summer I carried upon this land ten cords to the acre of the like compost as upon the seven acres. The next summer the crop was equally good as the first crop upon the seven acres, but decreased the two following years, and kept pace with the seven acres. I am well satisfied that my meadow should be manured, as I have done, and with like quantity of manure, every winter after the third cutting or third summer, and by this management my meadow will continue to produce good crops of grass without any other cultivation, except keeping the ditches well cleared out. I consider this experiment upon the three acres the best, considering the amount of labor; and should have continued it upon the remaining portion of my meadow, had the surface been smooth and even, but it was very rough and uneven, so that I was compelled to plough it.

"In the exact manner I treated the acres, the three excepted, I have my whole meadow of 70 acres in good grass cultivation, all but fifteen acres, which I ploughed last fall in order for sowing in the spring. My crops of oats and grass have been uniformly good as upon the seven acres. The last summer my oats were sown late, and I cut them for fodder.

"I am, gentlemen, with due respect, your humble servant, ORIN DALRYMPLE."

We beg the reader to remark, that although the lands drained were covered with "a fine black mould, six to nine inches deep," it required a top-dressing once in three years, to maintain its productiveness in grass; and that under this treatment it yielded an enormous profit, in one case exceeding $100 per annum on an acre. We here have a demonstration of the exhausting effects of constantly mowing the same field—of annually carrying off the crop of grass, and returning nothing to the field to maintain its fertility—and we have a strong argument in favor of the alternating system, wherever it can be introduced. Old meadows will not yield more than half a crop, unless they are triennially top-dressed with dung or compost, as practised by Mr. Dalrymple; and to do this, in ordinary cases, is wasting manure. The manure will do twice as much good if it is buried in the soil, in an unfermented state, and first used as food for a hoed crop; and the operations of tillage divide and loosen the soil, and render it more permeable to air, heat, dew, and the roots of the grasses. Those who must, or will have permanent meadows, should follow the example of Mr. Dalrymple, top dress them once in three years, if they would reap the full profits of their labor.

The above will serve to show the advantages arising from draining and reclaiming swamp land, as practised by a Yankee Dalrymple. And it is a singular coincidence, that the evidence of the expense and profits of furrow draining, which first presented for illustrating this subject, is from a Scotch farmer of the name of Dalrymple. We copy in his own words from the Edinburgh Quarterly Journal of Agriculture.

"I am clearly of your opinion," says Mr. Dalrymple, "that well authenticated facts on economical draining, accompanied with details of the expenses, value of succeeding crops, and of the land before and after draining, will be the means of stimulating both landlords and tenants to pursue the most important, judicious and *remunerating* of all land improvements. The statements below will prove the advantages of furrow-draining; and as to the *profits* to be derived from it, they are *great*, and a farmer has only to drain a five acre field to have occular proof upon the point.

"1832, No. 1, Easter, Ladywell and Whinny fields, containing 54 acres, cost £303.17s. for draining; average say £5.12 per acre. These fields were *not* furrow-drained, but cross-drained, and are *not dry enough*. The wheat sold for £11 an acre in the Easter field, the turnips in the Ladywell field at £20.13.4. The drains were all built and covered with small stones, which were obtained quite at hand. The land was formerly completely covered with rushes. Soil stiff (provincial *chattery*) clay, and used to let in pasture at 20s. an acre. Last summer, 1836, the Easter field fed five Cheviot ewes and lambs to the acre.

"1833, No. 2. Horseless and Jennyside fields, 16 acres, cost for draining £98.7s; say average £5.9s per acre. These fields were furrow-drained, 18 feet between each drain, 30 inches in depth, cut with the common and narrow spades, and filled 18 inches with slag, (scoriae,) from an iron furnace contiguous. All the mouths of the furrow drains terminated in main drains, 36 inches in depth, laid with tiles and soles. The fields are *now perfectly dry*. There was a very fine crop of wheat, about 8 acres, which sold for more than £13 an acre. The potatoes brought 15 guineas, and the turnips £21. The land was formerly occupied with whins and rushes, and let for 12s. an acre. When let for pasture I expect to get 50s. an acre for the land. [An increase in value of more than four hundred per cent, and of rent more than sufficient to pay the heavy expense of draining in three years.]

"1836, No. 3. Longbog, nine acres. Cost for draining £69, say average £7.13s. per acre. This field was furrow-drained 16 feet between each drain, 30 inches deep, and cut as in No. 2. The field *is dry*, and bore a good crop of oats. The land was previously drowned with water, and covered with rushes, and brought about 25s. an acre for grazing. A large portion of this field was very stiff clay; but now (Feb. 1837,) that it has been twice ploughed, the soil is quite changed, both in substance and color. The reason why this field cost so much more for draining than No. 2, was, that it was drained in very wet weather, when the land became so poached with carting, that I was nearly beaten with it."

We now transfer, from the work just quoted, the testimony of Mr. Howden, another Scotch farmer, in favor of the great advantages of furrow-draining.

"I have practised the system of furrow-draining," says Mr. Howden, "to a considerable extent, and am fully satisfied that it is one of the greatest improvements ever introduced into our agriculture. It is not easy to say, with certainty, as to the exact increase of produce which may be derived from it, so much depending on the nature of the soil and seasons. The farm which I at present occupy, consists mostly of a clay soil, resting in general upon a retentive sub-soil, and, consequently, was much injured from the retention of rain-water, and, in some places, from water springing from below. The method I am adopting for laying it dry, is, where the subsoil is very retentive, to put a two feet drain into each furrow [dividing the ridges] the breadth of the ridges being 18 feet. Where the subsoil has a tendency to draw under-water, I lay two such ridges together, and put a drain into each furrow, [thus making the distance between the parallel drains 36 feet,] the depth of which is regulated by the nature of the subsoil; but in general they are 2½ feet in depth. There being but few stones on my farm, I use tiles, which I find answer uncommonly well; indeed I would prefer them to stones, even admitting that I had them upon my farm, for these reasons:—Drains are cut in winter, and in most seasons, and particularly the present, it is almost impossible to get stones brought forward to the drains, and to induce women to fill them; besides, the injury which the land sustains by poaching with carts is considerable. Where land has a good declivity, stones, *when well broken*, will admit the water for a considerable time; but when land is nearly flat, tiles have a decided advantage for durability of drain. In covering in the tiles, I either put in some brush wood or mix a little of good earth with the subsoil, in order to allow the absorbed water to sink more freely into the drain. I am aware that some people have a prejudice against tiles, and allege, that in a few years, the earth above them will consolidate so much as to become impervious to water. I can only say, that I have used them for twelve years, and find the water making its way by them as freely as when the drains were first executed. With regard to the expense of draining a Scotch acre [four Scotch being equal to about five English acres,] with the tile drains at 18 feet asunder, and two feet in depth, it will cost for cutting and filling 3½ pence per rood of 18½ feet, or £2.6s. per acre. Prime cost of tiles is 40s.* per thousand, [which the editor says is too high.] Being seven miles distant from the kiln, I must add 8d. per 1,000 for carriage. Say that 2,700 tiles are required, their cost will be £6.9.6, making the total expense of draining £8.15.6 per acre. The expense no doubt is great, still I am of the belief, that upon all damp, heavy lands furrow-draining will repay, on an average, from 15 to 20 per cent on the outlay."

The lands, with us, which it would most profit the farmer to drain, are such as are marshy, and have not been exhausted of their fertility, of which there are vast tracts. Let us assume as data, the highest estimate of expense stated by Mr. Howden, which would be about $31 per English, or common acre.—The lands we refer to are now virtually unproductive. The outlay would bring them into the most productive state, say three tons of hay per acre, or its equivalent in grain or roots. Almost any where in the valley of the Hudson, or near a market, the average price of the hay may be stated at $10 per ton, and the product of the acre at $30. Deduct from this 33 per cent, or one-third, for making and carting the hay, fencing, &c. and the nett profit of the acre would still be $20 per annum. Suppose there are 20 acres thus reclaimed from waste. In twenty years the nett profit would amount to 8,000 dollars. Deduct from this one half for triennial manuring, the outlay of the $620 for draining, and for incidental charges, and there remains the snug sum of four thousand dollars, or two hundred dollars a year, as a reward for the improvement. We honestly think this estimate is a safe one. In a field we last year lost an acre of potatoes, besides our labor, by reason of the water, coming from spouts and springs, keeping the ground wet, although it had been already imper-

* Draining tiles are made by Mr. Jackson, in Albany, and sold at $15 per thousand, with an extra charge of $7.50 per thousand for soles, if required. For the latter, however, hemlock boards are a good and cheap substitute.

fectly drained. Tile drains laid in autumn, have rendered it so dry, that the corn now growing upon it, received no particular injury from the heavy and continued rains with which we were drenched in the month of May.

Experiment with Corn.

"I have succeeded with the Dutton corn admirably," writes a Dutchess correspondent, "and have planted it this year exclusively. I planted last year four different varieties,—the Dutton, early Canada, (seed from Poughkeepsie,) eight rowed white, and corn said to be Egyptian, eight rowed. The Dutton ripened two weeks before the others, and yielded better. The cob is very large, and that would be objectionable, did it not take a good deal of corn to cover it."* It is well to remark, that after raising this corn eighteen years—the seed having been obtained from the gentleman whose name we gave it, we do not perceive any diminution in its early ripening property, which we ascribe to the fact, that we have always selected the earliest ripened ears for seed.

* See letter of Mr. H. Clark, under Extracts.

The Main Objects

Of farming are, or should be, two fold, viz: 1st. The greatest nett profit, with reference, however, 2dly, to the improvement, or at least to the preservation of the fertility, of the soil. He that wears out his land, by a parsimonius stinting of manure and labor, and close cropping, with a view to *present gain*, may be compared to the intemperate man who parts with his last cow, that fed his family, to gratify intemperate indulgencies. While good land pays always a liberal reward to labor, poor land often beggars its proprietor. The fault is often admitted, that our farmers cultivated *too much* land to cultivate it well; that they are parsimoneous of their expenditure to put it and keep it in good order; and that they rely more upon propitious seasons, good luck, and the special bounties of Providence, for good crops, than they do upon judicious management—upon the capital and labor employed in the improvement of their grounds. There is no sounder maxim for the guidance of the farmer, than that which teaches—"WHAT YOU DO, DO WELL."

Among our extracts in this day's paper, will be found a communication from "A Hampshire Farmer," which we copy from the Farmers' Magazine, contrasting the profits of the old and new system of husbandry, not only as verified in his own practice, but in that of Von Thaer, whom we agree with the writer in pronouncing pre-eminent in both the theory and practice of agriculture. And we beg our readers to mark the result:—"On the improved system the expense of cultivation is *double*; the gross product is TRIPLE; the nett produce is QUADRUPLE!

The great danger in the West,

Is, that the soil is so fertile, and so remote from the ultimate market for its produce, that there will not be sufficient inducements to industry, to ensure moral and physical health to its population. Where men can earn enough in two days to support them seven, they are too much inclined to spend the five in indolence, especially when the time comes, as come it may, that the many are sellers, and the few only buyers, of the products of the soil. And when a people are idle, from whatever cause, they readily, though often imperceptibly, slide into indulgences and habits which are the bane of individual and public virtue—unless their idle hours are appropriated to the improvement of the mind, and to the cultivation of a taste for rural embellishments, and the higher intellectual pleasures which emanate from literature and the science of agriculture. It requires far more philosophy and fortitude to resist the smiles of prosperity, than it does to bear the frowns of adversity. The latter is matter of necessity—while in the first we are left to exercise our own discretion. We have been led to these remarks, at this time, by the receipt of a letter from an esteemed friend in West Wisconsin, (Ioway) an extract of which we subjoin.

"With us in the west," says our correspondent, "the lands are rich and productive, with but little labor. A bountiful Providence has bestowed upon us one of the most fertile and delightful regions of the earth. Yet what are the bounties of Providence when unemployed by the labor and science of man? The mind is fallow, and the 'Garden of God' lies barren and overrun with weeds, and the rose and lily are choked by brambles, unless the assiduity and skill of man are exerted in developing the riches and beauties of nature.

"Until the recent *healthful* check of the 'times,' the west was intoxicated with the fell spirit of speculation. Labor and industry were looked upon as too slow and tame a way of making money. The 'royal way' of making a fortune by speculation infested all classes; and, as a consequence, the main pillar and ornament of a state was almost entirely neglected.

"But it is to be hoped, that these times for sober reflection may correct the delusions of the day, and impress upon the minds of the community this fact, that *there is no accretion to individual or national wealth, without the exercise of labor and skill*; and that that pursuit which 'feeds all,' and which can employ all, is at once the most independent and honorable."

This mention of the mania of speculation calls to mind the facetious relation of a brother Yankee, who made the grand tour of the "Far West" in 1836. After describing the fertility and beauty of the country, in glowing terms, he added, after a pause—"but, the *inhabitants* will starve! their work is altogether of the *head*, and not of the *hands*—they are trying to live by speculation more than by labor. Why, if you accost even a farmer in those parts, before he returns your civilities, he draws from his breeches pocket a lithographic city, and asks you to take a few building lots, at half their value, and earnestly presses you to buy as a personal favor conferred on you."

We are heartily glad to learn by our friend's letter, that the times are mending beyond the Mississippi, and that the public attention is being turned to our parent art, and a strong evidence of the truth of his declaration came enclosed, in the form of a twenty dollar bill, being the subscription money for twenty-two copies of the Cultivator.

Advantages of Science.

The British Farmers' Magazine abounds in communications, urging the establishment of a national agricultural institution. Scotland is particularly referred to as affording a striking illustration of the utility of such associations. Forty years ago, says one of these writers, Scotch husbandry was far inferior to that of England; but now, he says, it is manifestly superior. This is ascribed mainly to the influence of the Highland Agricultural Society, to the interest which the nobility and gentlemen of wealth have taken in diffusing agricultural science, and promoting agricultural improvement, and the establishment of museums for the exhibition of agricultural products, and models of agricultural implements.

Among these writers is a Mr. Handley, who has addressed a very able letter to Earl Spencer, who seems to be regarded as the pioneer in this praiseworthy project. The following extracts from this letter will not fail to interest the reader.

"Science—by which is to be understood, that knowledge which is founded upon the principles of nature, illustrated by demonstration—is the pilot that must steer us into those hitherto unexplored regions, where I am well convinced a mine of wealth is still in store for British agriculture. Chemistry, botany, entomology, mechanics, require but to be invited, to yield a harvest of valuable information to guide and to warn us.

"What has been the course adopted by our enterprising manufacturers? Had they been satisfied with the inventions which chance or the intelligence of their artizans might have discovered, in vain would they have struggled for the proud ascendancy which they now hold in the scale of the manufacturing world. How truly has it been said, that a Manchester manufacturer, who had been absent from England for the last seven years, would be ruined, if, on his return now, he endeavored with his former processes, to compete with the almost daily improvements of his indefatigable and intelligent rivals. How many thousand acres of land would the bleaching operations of Manchester alone require—what enormous capital would lie stretched for weeks unproductive on the sward—and how impossible would it have been to have completed the accumulated orders from foreign customers, had not chemistry furnished a cheap and rapid substitute?" * * *

The writer then adverts to the still disputed and unsettled questions, whether it is better to apply manure in a fermented or unfermented state? What are the principles upon which lime proves beneficial to lands? That nothing has been definitely settled upon the latter point, is evidenced by the fact, that "vast sums of money have been, not only uselessly expended, but much labor has been thrown away, in anticipation of beneficial results from the use of lime, which had the subject been better understood, might have been saved, but positive injury has resulted, which in thousands of acres has proved irredeemable." The same uncertainty is then pointed out in regard to the operation of gypsum, of salt; and also in many other interesting and important branches of agriculture, which can only be settled by chemical and philosophical research.

"*Botany*"—continues Mr. H.—"by which I would be understood to mean, not that branch of the science which is confined to nomenclature and classification, but which treats of the structure, the economy, the properties, uses, and diseases of plants, a correct knowledge of which tends to increase their number, and improve their quality, offers to the farm not less valuable truths than it imparts to the garden. The important labors of Mr. Knight, for instance, uniting as he does the ablest practice with the most profound science, and who has successfully cultivated the principles of the philosophy of vegetation, and thus improved the practice of horticulture, are alone sufficient to stimulate the agriculturist to extend his inquiries into the same field of interesting and useful discovery.

"The diseases of plants, whether arising from a superabundance or deficiency of juice, from its impure qualities, or from external causes, though at various times treated of by practical and scientific writers, are as yet very imperfectly understood.

"*Mildew, rust, smut*, and a variety of diseases familiar to every farmer, continue prevalent, and baffle all attempts to guard successfully against them, notwithstanding the numerous nostrums quoted as infallible.

"How they are originated or propagated is still matter of doubt; yet this knowledge is essential to the cure. The preparation and choice of seed, the manures applied, their nature and quantity, and the culture of the soil, are probably all, more or less, intimately connected with their existence, and, if carefully and scientifically considered, might furnish the remedy.

"The rotation of crops, and their comparative tendency to exhaust the soil on which they grow; their effects upon each other, in either furnishing or extracting the nutriment requisite for their successor; the theory of their excrementitious operation; the facilities they respectively afford to the propagation or destruction of noxious weeds; the still more important investigation as to the value of different plants and grasses as food: the most advantageous methods of cultivating them; their power to withstand seasons; the disposition of seed grown in southern latitudes to retain its propensity to early vegetation and maturity, though sown in the north; the benefits derivable from change of seed under all circumstances; the rules for selecting and improving new varieties, a subject so ably treated by Col. Le Coutier; and the habits, modes of growth, and peculiarities of weeds, which affect agriculture, and the most effective means of extirpating them; with many other similar subjects which it is unnecessary to enumerate, come within the legitimate range of the botanist's inquiries, and would render his co-operation invaluable to the agriculturist.

"*Entomology*, and that branch of *Zoology* which appertains to worms, furnishes another subject for scientific research, most interesting and important to agriculture.

"Lastly, I would refer to the benefits which would accrue to agriculture, were the *mechanism* of our implements more scientifically attended to. Mechanical men, possessed of talent competent to the production of the highest class of machinery, cannot be expected to draw upon their invention, unless, as in manufactures, they are stimulated to exertion by the assurance, that success in the improvement of old, or the invention of new machines, would ensure their reward, from premiums or general demand. Were such the case, it may be safely predicted, that the construction of even our simplest implements, which in fact constitute the mechanism of agriculture, would not be left to the contrivance of village smiths, but would command the attention of men whose intelligence would lead them to calculate the nature and amount of the various and frequently conflicting forces to be overcome, and whose mechanical skill would give to every implement its most effective shape."

Insect Enemies.

An interesting paper on the insects most injurious to our crops, by James Duncan, is published in a late Quarterly Journal of Agriculture. Mr. Duncan states, on the authority of Mr. Spence, the entomologist, that on a fair computation, 60,000 bushels of seed wheat are annually lost to the British farmers, by the ravages of the wire-worm, (*Cataphagus obscurus*,) and an expense incurred in dibbling and harrowing in where the seed is destroyed, of £15,750. The hop-fly (*Aphis humuli*,) sometimes occasions an annual loss of £415,000 to the British revenue, in the tax which the government imposes upon this article; and the turnip fly, (*Haltica nemorum*,) according to the Linnean transactions, has occasioned a loss, in the single county of Devonshire, of £100,000 in one year. The depredations of the grain-worm, in all probability, will this year cause an immense loss to the farmers of New-York.

As a preventive of the ravages of the turnip fly, Mr. Duncan says, "soot, ashes, &c. have been used for this purpose, but there can be no doubt that by far the most useful application of this kind is quicklime," strewed, we presume upon the young plants in the morning, while the dew is upon the leaves. Upon garden plants, as radishes, cabbages, &c. which are liable to be destroyed when in the first leaf, Mr. D. says that strong soap suds, thrown with a garden engine or syringe, is destructive to the insect; indeed that any liquid, even pure water, often thrown upon the plants, serves as a preventive—as moisture is prejudicial to them, they not attacking the plant but when the leaves are dry.

Five Hundred Sovereigns.

The Highland Agricultural Society have offered a premium of 500 sovereigns, "for the first successful application of steam-power to the cultivation of the soil," that is, to ploughing, harrowing and preparing the ground in an efficient manner. The total premiums to be awarded by the society the current year, amount to about 3,500 sovereigns, equal to $15,000, exclusive of more than fifty gold and silver medals.

Mulberry and Sugar Beet.

Mr. Randolph, chairman of the committee on agriculture, has made a report to congress, on the subject of giving governmental encouragement to the culture of the mulberry and the sugar beet, which embraces letters, upon these subjects, from gentlemen in different parts of the Union, and recommends the adoption, by congress of a resolution—

"That the President of the United States be, and he is hereby, authorized gratuitously to lease, for the cultivation of the mulberry or sugar beet, for the term of ten years, any lot of land belonging to the United States, and not included in the unlocated or public lands."

Trifling as is the encouragement proposed, we are doubtful whether it will be granted. Agriculture is of no party, and has nothing to proffer to subserve the political or personal aggrandizement of legislators; and she is too humble in condition, and too modest in her demands, to expect aught from their liberality or foresight. She shares least in public bounty and patronage, though she contributes most to national wealth and national character. She cannot fawn, and will not menace, and consequently is neither favored nor feared.

The letters appended to the report, however, contain much valuable information on the choice of the mulberry and the management of the silk-worm.—We propose to notice some of the prominent and useful facts which these letters contain, for the benefit of those who are engaged in the business.

Joseph C. Parsons, of Northampton, cultivates five kinds of the mulberry. He prefers many varieties to the multicaulis, and gives a preference to the Canton, which he thinks will stand our northern winters, though we are somewhat constrained to doubt it.—From 100 of the Florence he produced, by layers, in one season, 1,747 plants. He laid in April, and laid the largest of the spring growth late in July. The plants were 18 to 24 inches in height. He thinks the multicaulis will not answer so far north; and that the mulberry should have a western, not a southern exposure. It seems he takes up and buries his seedlings in autumn. In regard to the beet, we learn from Mr. Parsons's letter, that the legislature of Massachusetts have proffered a bounty of three cents per pound for all sugar made in the state, from the beet root, for five years; he thinks the product can be made to equal 50 tons per acre—a pretty liberal calculation—which will yield, at only 4 per cent, in sugar, 4,000 lbs., and will entitle the manufacturer to a bounty from the state of $120 per acre. If we estimate the sugar at 6 cents per lb., its value will be $250, which, added to the bounty, will give $370 as the product of an acre, besides the beet cake!—the culture and manufacture to be deducted. A large profit, if half what is here stated should be realized.

George Green, of Belvidere, N. J., prefers the multicaulis, even though it should not withstand the winter, a fact of which he seems to admit there are doubts; "for," says he, "the roots may be taken up and buried in pits, like potatoes or turnips, or thrown into cellars until spring, and then replanted." He seems to depend upon the annual growth from the roots, and not upon trees or hedges; and he terms this "summer-cropping."

Hervey Hammond, of Lewisburg, Pa., prefers the multicaulis, as being easily propagated, tenacious of life, affording an abundance of foliage, which is gathered with facility, liked by the worm, and producing good silk. He recommends a light, high, sandy soil. Plant, he says, "in rows, six or eight feet asunder, and 12 or 14 inches in a row, and cut off the trees or tops within five or six inches of the ground, late every fall, and cover the stumps with earth, *so as to protect them from cold in winter.*" Thus it would seem, that in Pennsylvania, three degrees south of us, it is recommended annually to cut down the multicaulis, and to cover the stumps with earth, *to protect them* from cold in winter—a practice which will at least be irksome and inconvenient to a northern farmer.

Jacob Corklin, jr., whose residence is not indicated, cultivates the white mulberry in hedge rows, and from the leaves on forty rods of hedge obtained three bushels of cocoons, which were worth $9. An acre, he says, will give 24 bushels of cocoons, or $72.—Mr. C. has raised the sugar beet. He estimates the expense of culture, including manure and rent, at $25 per acre, and the crop at 1,452 bushels of 50 lbs., and he considers them as good for farm stock as any other roots.

The fifth letter is from Daniel Stebbins, of Northampton. It goes largely into detail in regard to the mulberry and silk business. Mr. Stebbins recommends a poor, light, dry soil, for the mulberry. He thinks the multicaulis does not ripen its wood well, and is liable to be injured by the winter. He prefers the Canton, the seed of which came from the Canton mission, and which Mr. S. terms the *Canton* multicaulis. In the same soil and exposure in his garden, during the winter, the Manilla (common multicaulis) was much injured, the Canton and Asiatic unhurt, and the Chinese and Smyrna uninjured. The seed of the multicaulis does not produce its like, but plants with inferior leaves. A gentleman who kept an accurate account, ascertained that his silk cost him *two dollars* a pound, and it was worth in the market from six to seven dollars per pound. The bounty given by the state is about sufficient to cover all the expense of gathering the leaves, feeding the worms, and reeling the silk.

The 6th letter is from Chauncey Stone, Burlington, N. J., who recommends a loose dry soil, and an undulating or hilly surface, for the plantation. He prefers the multicaulis. He recommends planting in rows eight feet asunder, and the trees four feet apart in the rows—to manure and cultivate the ground, and when the season of growing is over to cut them down near the ground, to induce them to "send up seven stalks where one grew the prior year." An acre is estimated to produce 5,000 lbs. of leaves in a season, and a nett annual profit of $50.

C. F. Durant, we believe the celebrated æronaut, writes the seventh letter from Jersey city, Mr. Durant gives a decided preference to the Brussa mulberry—the kind introduced by Mr. Charles Rhind, from Brussa, in Turkey. He thinks the genuine cannot be propagated by seeds, but only by scions from the *same parent stalk*, produced by cuttings, inoculation of engrafting. Mr. Durand, we think, carries his theory too far. Seed will produce like the parent tree, if there be no other variety or species of the same genus growing in the vicinity, to affect the blossoms, or seed. And besides, *Mr. Rhind's trees were all produced from seeds*, and they certainly exhibit a sameness in wood and foliage. We are glad to find Mr. Durant concur with us as to the merits of our native mulberry. "The native black [red, rubra] is equal in quality," says Mr. D. "to the best in the world; the leaf is *smaller* than the Brussa, and is therefore inferior in *quantity*, because one hundred pounds of large leaves can be stripped at less expense than the same weight of small leaves." In propagating by the bud, Mr. D. recommends, that in the spring, when the buds have swelled almost to bursting, cuttings be made, of three eyes to each, and planted one foot asunder, in rows three feet apart. "Every farmer in the states south of 45° N. lat." says Mr. D. "can raise from 100 to 800 dollars worth of cocoons in the *spare room* of an ordinary barn or dwelling, and this would be considered *all profit*, if the silk is considered, like poultry, a collateral branch of farming." The total expense would then be the price of the trees, and the transporting the cocoons to market, which Mr. D. puts at $5.28, and leaving a nett balance of $105.72, which he considers a low estimate for a "small farmer." We agree with Mr. D. that the silk business should be a collateral branch of farming, and not a joint stock concern.

The next letter is from E. P. Roberts, editor of the Farmer and Gardner, Baltimore, who has been long engaged in the culture of the mulberry, particularly the multicaulis, and has grown the beet, though not manufactured sugar from it, to a considerable extent. Mr. Roberts recommends a sandy or gravelly loam for the mulberry, a high situation, and a southern aspect. He considers the multicaulis "beyond all comparison the most valuable species of mulberry grown;" and he would plant it on high ground, because there "the wood ripens better, and the *frosts* do not affect them so much as in *low* situations." Thus we see this inveterate enemy of the multicaulis, *Jack Frost*, pursues it even to the mild climate of Maryland.—And even the morus alba, which is generally affected by *our* winters, does not escape in Maryland: Mr. Roberts says he lost 70,000 plants of it in one winter. Mr. Smith propagates the multicaulis by cuttings of one bud, placing all but the tip of the bud in well prepared soil, inclining the upper end to the south in an angle of 45, pressing the earth around it, and watering if the weather is dry. As to the profits of the silk culture, Mr. R. estimates the expense of managing an acre at $203—the product at $1,333.33⅓—and the nett profit at $1,129.48⅔.

The 9th letter is from an esteemed friend, J. A. Downing, of the Botanic Garden and Nurseries, at Newburgh. Mr. Downing gives the preference to the "Chinese (*morus multicaulis*) and the Brussa,"—the first south of lat 42°, and the latter in all parts of the Union too cold for the Chinese. As the Brussa was first raised, on this continent, in Mr. Downing's immediate neighborhood, his opinion of its value is entitled to great weight. "The Brussa mulberry," says he, "is remarkable hardy, and produces a great abundance of foliage, larger, finer, and of superior quality to that of the Italian. It is yet rare in the country, having been introduced by Mr. Rhind, from Turkey; and the principal stock of trees (about 20 or 30,000) is now growing in this town. Silk has been manufactured from it of most excellent quality, which took the premium at the late Institute fair, at New-York. Mr. Downing recommends the cultivation of mulberry hedges, sufficiently wide apart to admit the free passage of the plough for culture, and of a hand-cart for gathering the leaves. Plants from 18 to 24 inches apart. In propagating by cuttings, Mr. D. recommends that pieces be taken from 6 to 18 inches long, and inserted in the ground the whole length, up to one or two buds.

Then follows a letter from Charles Kaigne, and one from Andrew T. Judson, of Connecticut. Mr. Judson's letter contains a compendium of all the information he had collected in relation to the silk business, in answer to queries which he had sent abroad. It is too long for our present purpose, and it cannot be abridged without doing it injustice.

Extracts from Mr. Pedder's report, which we have formerly noticed, on the culture of the beet, and the manufacture of beet sugar, closes the documents, saving an official statement exhibiting the imports and exports of silk and sugar from 1832 to 1837. From the latter it appears that the value of silk imported in 1837,—

Amounted to..... ..	$14,352,823	
Do. exported,.....	1,207,802	
Home consumption,.....		$13,145,021
Sugar imported, value, ...	$7,802,668	
Do. exported,.....	2,650,052	
		4,652,616
Amount retained in both, ...		$17,797,637

This pamphlet has confirmed us in the opinion, that the multicaulis is not suited to our northern climate; that the Brussa and native red must be our main reliance, if the latter proves hardy, as we think it will. It is unquestionably excellent for silk; and the reason it is not noticed by most of the gentlemen who wrote to the committee, is, that it was unknown to them, except by reputation. On the subject of the multicaulis, we subjoin an extract from the Southern Agriculturist, being a paragraph from a letter from a citizen of Charleston, J. H. May, Esq., to Dr. Johnson, without any view other than that of apprising our readers of the matter it contains. The letter is dated Sept. 1837, at Paris. The extract is as follows:

"*Silk-worms.*—This is a subject of deep concern to our country. Prince and others have propagated and recommended the 'morus multicaulis,' as the best subject for that 'purpose—do all you can to destroy this opinion. Noisette, who has studied the morus more than others, tells me there is none equal to the common white, (morus alba); that the multicaulis, after four or five years, dies, or vegetates badly. This is experience—profit by it."

It is proper to say, that the causes of its dying, or vegetating badly, in France, may not exist in the United States.

Mode of analyzing Lime, and interesting facts in relation to its application.

"In eastern Pennsylvania, lime is the great source of improvement; and of this we have all the different varieties, I suppose, that can be named. We want some plain simple rule, by which any farmer may analyze lime, and be able to judge which of the different kinds is most useful to agriculture. We have primitive and secondary lime stone, also that which contains large quantities of magnesia, which we find very injurious to vegetation, and which I should like to detect before using it. Send us rules, in the Cultivator, to try lime, and you will oblige yours, &c.

"BENJ. F. BADOLET.

"*Pugstown, Chester county, May* 25."

Before we reply to our correspondent, we cannot but repeat our regrets, that chemistry, so important in all the arts of productive labor, is not made a branch of instruction in the schools of farmers' boys, as it is in Germany, France, and elsewhere; and that we have no schools of instruction for them, in the theory and practice of husbandry, like those of Hoffwyl, Moegelin, Templemoyle,—of France, and of most of the German states. The benefits that would result alone from teaching the young farmer, scientifically, to determine the qualities of his soil, its defects, and the proper means of improving it by lime, marl and manures, would more than remunerate the public for twenty agricultural schools; or for suitable books of instruction in these matters, to every school in the nation. Science is almost indispensable to good and successful husbandry. See our *extracts* to-day. Orfila says—

"It is impossible to lay down any general rules respecting the fitness of lime for the purposes of agriculture, because much must depend upon the peculiarities of soil, exposure and other circumstances. Hence a species of lime may be extremely well adapted for one kind of land, and not for another. All that can be accomplished by chemical means, is to ascertain the degree of purity of the lime, and to infer, from this, to what kind of soil it is best adapted. Thus, a lime which contains much argillaceous earth, [clay] is better adapted than a purer one to dry and gravelly soils; and stiff clayey lands require a lime as free as possible from the argillaceous ingredient.

"To determine the purity of lime, let a given weight

be dissolved in diluted muriatic acid. Let a little excess of acid be added, that no portion may remain undissolved, owing to the deficiency of the solvent. Dilute with distilled water; let the insoluble part, if any, subside, and the clear liquor be decanted. Wash the sediment with farther portions of water, and pour it upon a filter, previously weighed. Dry the filter, and ascertain its increase of weight, which will indicate how much insoluble matter the quantity of lime submitted to experiment contained. It is easy to judge, by the external qualities of the insoluble portion, whether argillaceous earth abounds in the composition."

The diluted muriatic acid dissolves the lime. The insoluble residuum is clay or sand.

To detect magnesia in limestone, which, according to Tennant, renders the lime, when applied in large doses, prejudicial to lands, Orfila directs as follows:

"Procure a Florence flask, [a common half pint olive oil flask,] clean it well from oil, by a little soap-lees or salt of tartar and quick-lime mixed, and break it off about the middle of the body, by setting fire to a string tied round it, and moistened with oil [spirits] of turpentine. Into the bottom part of the flask, put 100 grains of the lime, or lime-stone, and pour on it, by degrees, half an ounce of strong sulphuric acid. On each effusion of acid, a violent effervescence will ensue; when this ceases, stir the acid and lime together, with a small glass tube or rod, and place the flask in an iron pan filled with sand. Set it over the fire, and continue the heat till the mass is quite dry. Scrape off the dry mass, weigh it, and put into a wine glass, which may be filled up with water. Stir the mixture, and when it has stood half an hour, pour the whole on a filtering paper, placed on a funnel and previously weighed. Wash the insoluble part with water, as it lies on the filter, and add the washings to the filtered liquor. To this solution add half an ounce of salt of tartar in water, when, if magnesia be present, a very copious white sediment will ensue; if lime only, merely a slight milkiness. In the former case, heat the liquor by setting it in a tea-cup near the fire; let the sediment subside; pour off the clear liquor, which may be thrown away, and wash the white powder repeatedly with warm water. Then pour it on a filter of paper, the weght of which is known, dry it and weigh. The result, if the lime *stone* has been submitted to experiment, shows how much carbonate of magnesia was contained in the original stone; or, deducting 60 per cent, how much pure magnesia 100 parts of the lime contained. If the burnt lime has been used, deduct from the weight of the precipitate 60 per cent, and the remainder will give the weight of the magnesia in each of the 100 grains of burnt lime."

The sulphuric acid dissolves the lime and magnesia, which pass through the first filter with the liquid. The salt of tartar precipitates the magnesia, leaving the lime in the liquid. The magnesia is the residuum upon the second filter.

We add some relevant facts in regard to lime, from the Domestic Encyclopædia.

In burning lime, a ton ought to be reduced in the kiln to 1100 weight; otherwise it is not sufficiently burnt. It will regain two-thirds of the lost weight, by exposure to air for a week or ten days—100 parts of lime absorb [and solidify] about 28 parts of water; and to regain its full proportion of air from the atmosphere, it requires a year or more, if not purposely spread out. All limestone of *primitive* formation, contains magnesia; all white *marbles* contain about ten per cent of magnesia. Put less of the magnesian lime upon your land, by about one-third, than of common lime.

The lands most benefitted by lime, are, 1. Rich black or brown friable crumbling loams, which abound with vegetable matter. 2. Low, rich drained meadows, that have formerly been bogs, and the black soil of which abounds in vegetable fibre. 3. Old pastures and commons, which have been under grass for time immemorial, and are first to be converted into arable land; but upon these, lime should not be repeated. 4. On moory, boggy, mountainous land, and on black peat earth. 5. On all other waste soils that have been overrun with fern, briars, bushes or wood, and which, though richly stored with vegetable food, have contracted an acidity, in consequence of their long rest, and the spontaneous growth of roots.

Mild lime, carbonate of lime, and marl, improve the texture of clays and sands, rendering the first less stiff and adhesive, and the latter more compact and retentive of moisture; and they improve all soils, not already charged with calcareous matter, by fitting them better to hold manures, and constituting a necessary constituent of most plants.

The soils which are not benefitted by quick-lime, are those which are poor, light and thin; those destitute of inert vegetable matter; strong stony lands; wet cold loams, and all lands which have not been sufficiently drained; and on stiff clays that are tenacious of moisture. Lime is only a manure of stimulus—not of nutriment.

Humus, Ulmin and Geine, are only different terms applied by philosophers to organic—to decomposed animal and vegetable matters, which constitute the fertility of soils, and the food of plants. In common language, they are MANURE under some of its modifications.

The Forty-fold Potato,

Derives it name, we believe, from its reputed prolific property. It is an esteemed variety for the table, and of recent introduction. An objection to its culture has been made, on account of the small *size* of the tubers, though they are not lacking in numbers; and this circumstance has induced us almost to discard them. A communication of Mr. Burns, in the May number of the Magazine of Horticulture, explains a common error in the culture of this variety, and suggests a remedy for the evil complained of.—This potato has many eyes, each of which produces a stalk; and where two or three tubers are planted in a hill, they give *too many stalks*, and *too many potatoes* for the ground they occupy. The consequence is, that the stalks are feeble and the roots small. The remedy is, to plant only one tuber of a medium size in a hill, the seed end of which, abounding in eyes, is first to be cut off and thrown away, when the residue may be divided into three parts, and planted in a hill. By this mode of management, the stalks will be few, have abundant pasture to feed upon, the tubers large, and the crop good. Such are Mr. Burns' directions; and to us they appear plausible, from the fact, that in the culture of the Rohan potato, a set with one or two eyes is found to be sufficient for a hill. We have counted forty-seven eyes in one Rohan; and we can readily believe, that this number of stalks in a hill could not produce many large potatoes. These hints may be useful in improving the product of other varieties of this valuable root.

Striped Bug and Turnip Flea.

At this season, our melons, cucumbers and other vines, are liable to be destroyed by the striped bug, in a few hours, and our young cabbages, radishes, turnips, &c. are liable to a similar fate from a small black flea. On visiting our garden a few days since, after several wet and cloudy days, we found many of our young vines, then in the first leaf, almost literally covered with the yellow bug, and our young cabbages also in the first leaf, in a fair way of being lost, in a few hours, by the black flea. We immediately sprinkled lime upon the vines and plants, and on the former took pains to put it on the under side of the leaves, and thereby saved our plants. Mr. Gordon, in the Tennessee Farmer, gives the assurance, founded on repeated experiments, that the sowing of two or three bushels of wheat bran, upon an acre of young turnips, will effectually secure the crop, as the fly prefers the bran to the turnip.

In the German and French Schools,

Are taught geography, history, chemistry, and several branches of natural science, drawing and music. These are taught in the common schools to the sons of farmers and mechanics. Upon these seminaries, well remarks Lord Brougham, "far more reliance is to be placed, [for the prevention of crime,] than upon all the provisions of the penal code, amend it as you may, and execute its amendments with whatever firmness and discretion you can bring to the administration af criminal justice." We pride ourselves as *freemen*—as being of a higher order than the *subjects* of the German and French monarchies, and yet we fall far behind them in what most ennobles our nature, and fits us for the greatest usefulness—*in the improvement of the mind*. Lord Brougham is right. Nothing tends more to prevent vice than habits of industry; and nothing serves to wed us to these habits—to give us pleasure and delight in them—so strongly, as a taste for, and advancement in, useful knowledge.

Axiom in Husbandry.

Plants, in general, will be found to deteriorate the soil, in proportion to their natural facilities of establishing a new progeny, [by stollens, suckers, or winged seeds,] at a distance from the deteriorated soil; consequently, such facilities, or the want of them, furnish good indications to the cultivator, of the extent or rapidity of the deterioration caused by particular species."—*Edin. Q. J. of Ag.*

As evidence of the correctness of the above, it is said, that young trees seldom send up succors till the soil has become exhausted of their peculiar food; but that when the soil becomes deteriorated, this is found to take place with the plum, pear, &c.—that the rose, to be kept in pristine health, should be removed to new earth at least every third year; that the removal of the raspberry is necessary every fourth year to preserve its vigor and fruitfulness, notwithstanding its propensity to send up succors; that the impatience of the strawberry to shift its location by runners, is demonstrative evidence of its deteriorating influence upon the soil. The necessity of alternating crops is further illustrated by the failure of the potato and the red clover, when returned too often to the same field.

The practical instructions suggested by these data, urge to the alternation of farm crops; to the change in pasture, or soil, of perennials which are found materially to deteriorate on the same site, as the strawberry, raspberry, currant, gooseberry, rose, &c. They teach, that the finer flowers of the florist, as tulips, hyacinths, &c. should be planted in fresh undeteriorated soil, at least every second year; that the soil should be rich and light, that their roots may extend themselves into fresh pasture, and that they should not be planted close, lest they rob each other of essential food. The deterioration of the potato in Ireland, a fact which the writer affirms, is ascribed to the repetition of the crop, on the circumscribed limits allowed to the peasant; and the diseases of the potato in Scotland, which, in some seasons, have been serious and alarming, are ascribed to over cropping.

Blasting Rocks.

We are not sure we are not retailing "*John Thompson's news*," by inserting the following, from the Domestic Encyclopædia. It will nevertheless be new to some.

"Quick lime is of great utility in rending rocks and stones, when mixed with gun-powder, in the proportion of one pound of the former, well dried and pulverized, to two pounds of the latter. This singular property of lime was discovered, and is related, by H. D. Griffith, Esq. in the 8th vol. of the Bath and West of England Society, where he states, that the mixture above specified, caused an explosion with a force equal to *three pounds* of gun-powder; hence in those operations, one-third of the expense may be saved."

Agricultural Libraries.

W. H. Richardson, Esq. has sent us from Richmond, a printed list of about 100 vols. of agricultural and horticultural works, belonging to the State Library in that city, and asked us to give a catalogue of such others as in our opinion ought to be added. A State Library should contain all the standard works which appertain to rural affairs, especially if husbandry is the great business of that state. But as this description of books might comprise too large a catalogue, we will confine our recommendation to a limited number, with which, with the exception of the three last we shall name, we have a personal knowledge; and the characters of the latter stand so high, that we have no hesitation in recommending the entire list. And we prefer giving our answer through this channel, that others who wish, may avail themselves of the information which it contains.

We recommend, as suitable for a state or agricultural library, *besides the books now in the State Library of Virginia*, Chaptal's Chemistry, 1 vol.; Loudon's Encyclopædia of Plants, do.; Farmers' Series of Library of Useful Knowledge, not completed; Michaux's American Sylva, 3 vols.; Quarterly Journal of Agriculture, (Edinburgh,) 40 numbers received; Farmers' Magazine, (London,) 8 vols. published; Low's Elements of Practical Agriculture, 1 vol.; Domestic Encyclopædia, Cooper's revision, 3 vols.; Kenrick's Orchardist, 1 vol.; Manning's Book of Fruits, 1 vol.; Lorrain's Husbandry, 1 vol.; Memoirs of the N. Y. Board of Agriculture, if they can be had, 3 vols.; Transactions of the Society for the promotion of Agriculture and the Arts, 4 vols.; Massachusetts Agricultural Journal and Repository, 7 or 8 vols.; Foster's Atmospheric Phenomena, 1 vol.; Lindley's Guide to the Orchard and Kitchen Garden, 1 vol.; Entomology, by Kirby & Spence, 2 or more vols.; Ronalds on the Apple, 1 vol. 4to.; Williams' (or some other,) Agricultural Mechanism, 1 vol.; the agricultural works of Von Thaer, and of Sprengel (German) and Dick's, on the Veterinary Art. The Bath papers, British Agricultural Surveys, and the Georgical Essays might be added. They contain much that is useful, but more that is either irrelevant to our practice, or that has been rendered valueless by modern discovery and improvement.

M. Jauffret's discovery of a new mode of making manure, noticed in our last, turns out to be a humbug. The Farmers' Magazine for March, states, that after having for two years duped dozens of mayors, prefects, and other functionaries, and taken the cash of hundreds of subscribers, the patentee died one day, and it was *then* discovered, that manure cost twice as much by the new as it did by the old process.

Harvest beverage.—Put a tea-cup full of fresh oatmeal into a gallon of cool water—stir it previous to drinking, and renew the water when it is exhausted. It will keep the bowels and the skin in order, preserve a due temperament of animal spirits, and nourish and invigorate the whole system. It is both food and drink. Try it. N. B. Kiln-dried Indian corn meal may be substituted for oat meal.

To Correspondents, &c.

DISEASES IN POULTRY.

"A Subscriber," at Morristown, N. J. loses most of his poultry. "They thrive well for the first three weeks," after being, we presume, shut up to fatten; they then sicken, and in two or three weeks die. "On examination," says our correspondent, "I find the windpipe filled with small red worms, from very small to the size of a coarse thread." The disease is new to us; and in prescribing, we refer rather to preventive than cure. We would change the food, occasionally mingle salt with it—give a bath of sand and lime rubbish, and clean and whitewash thoroughly the inside of the poultry-house, a measure that should be adopted at least every spring.

CAPONS.

To capon cocks (we write in answer to the request of a Long Island correspondent,) make an incision with a sharp knife, under the lowest rib, with your fingers lay hold of the parts to be extirpated, and cut them away with sharp scissors. Put a stitch or two in the wound. So Mr. Willich directs. The effect of the operation is to increase the delicacy and fatness of the meat, and the size of the bird.

R. E. Russell, of Camden, S. C. asks us, among other questions, what crops or shrubs will grow under the shade of two oaks in his garden, which he is not willing to spare? What is the best compost for a coarse sandy soil which "bakes very hard in dry weather?" What quantity of seed should be sown per acre, of red and white clover, lucern, timothy, herds grass, orchard grass, ruta baga, carrot, &c.? And we give the subjoined brief answers. For the shade of the oaks, select the handsome native or other shrubs which are found growing, or are known to grow in the shade of other trees, including the common and variegated holleys, laurels, &c. or sow orchard grass, or plant strawberries—having first made the soil mellow and rich. From the sand "baking," it probably has much clay in it. Lime or manure, or vegetable mould, will tend to improve its texture and increase its fertility. Sow on an acre 10 lbs. red and 1 lb. white clover; or a peck to a half bushel of timothy, if with clover; or a like quantity of herdsgrass; 2 bushels of orchard grass; or 15 lbs. lucern; or 1 lb. ruta baga; or as much carrot seed as will furnish plants to stand four to six inches apart, in drills 18 inches asunder.

TO KEEP FRESH MEAT.

What is the best method of preserving meat, say shoat, beef and mutton, during warm weather?—*Tennessee correspondent.* Answer. Keep it in a refrigerator, an ice-house, well, or other place, where it will remain dry and in a low temperature.

QUESTIONS PROPOUNDED BY A. SUMNER, OF S. CAROLINA.

1. What would be the proper season, in lat. 34, for sowing ruta baga, to produce the best crop? Can best be decided on trial. We suggested sowing at the far south in the month of August, that the crop, congenial to a cold climate, might come to maturity late. But Mr. S. Weller, of N. Carolina, (see Cult. vol. III. p. 144,) prefers sowing the middle of July. His crop was more than 600 bushels to the acre.

2. Is a crop of ruta baga of more advantage to stock than sugar beet? That is best which is found best adapted to the soil and climate. If the sugar beet does well, be content, till it is found, by limited experiment, that the ruta baga will do better. They are about equal in nutrient properties. The Swede prefers a sandy, the beet a loamy, and both a rich soil, and good care.

ILLINOIS FARMING.

We have received, from a valued correspondent, a rather facetious account of the popular mode of farming in Illinois, which we take to be rather a caricature than a true portrait; and we are partly confirmed in this opinion from the fact, that our correspondent has sent us twenty-two subscribers from the neighborhood upon which he indulges his sarcasm. If the farming is as bad as he represents, we hope the Cultivator will help to improve it.

RENOVATION OF OLD MEADOWS.

A Dutchess correspondent asks what is the best mode of renovating old meadows, the soil of which is clay; and what crops are proper for a rotation upon such soils? He will find these questions as satisfactorily answered in our March, May and present numbers as we are able to instruct him here. Peas, oats and potatoes will serve as good fallow crops upon his clay, to precede wheat; and we would not advise that the land be restocked with grass seeds until the sod is perfectly rotted, the ground ploughed deep, and well mixed and pulverized. The beans extensively cultivated on clays in Great Britain, are the horsebeans, neither adapted to our climate nor our wants.

APPLES OF 1836.

We have received from D. B. King, of Waterford, two apples, sound, and of pretty good flavor, of the growth of 1836, and raised by E. Howland. What gives particular interest to the circumstance, is the mode in which these apples have been preserved. In the summer of 1837, Mr. King kept his apples *in charcoal*; and in overhauling this in May, 1838, he discovered the sound apples, which had escaped notice the preceding year. Charcoal has long been noticed for its antiseptic or preservative properties; and it has been particularly recommended to pack seeds in it, to preserve their vital principle, in passing the equator. Might it not prove an excellent material for packing apples in that are to be shipped to Europe, or the south?

A LARGE CALF.

Thomas Coleman, of Lewes, Del. writes us, that he has a calf which, at six months old, weighed *five hundred and forty-five pounds.* It was fed upon ruta baga, potatoes and the milk of its dam.

MAPLE SUGAR.

We have received a sample of beautiful maple sugar, from M. E. Vail, of Bennington, Vt. white, dry, and well granulated, about equal to second quality Havana clayed. "I made from *eight* trees," says Mr. Vail, "*one hundred pounds* of the same I send you." This is an average of 12 lbs. the tree. If this sugar is made, or refined by any new process, we would thank Mr. V. to apprize us of the mode. If our maple sugar was purified with animal carbon, a material now extensively employed in sugar refineries, and which may be produced any where with little expense, and clayed, the process of doing which we have published, it would be equal to the best Havana.

ANIMAL CARBON AS A MANURE.

We have received a hogshead of pulverized burnt bone, from the Mess. Stuarts, corner of Greenwich and Chamber-streets, New-York, to make trial of as manure. We noticed sometime since, that this article had been imported into Scotland from Sweden, and profitably applied to the soil. That which we have received has been enriched by having been used in the sugar refining, and is of course charged with mucilaginous matter. We have little doubt of its utility; and the price we understand it is sold at—25 cents the barrel—is certainly low enough.

BRUSSA MULBERRY.

We have received from N. Haight, Esq. of New-York, a compliment of four ounces of seed of the Brussa mulberry, imported from Smyrna. If our predictions should be verified, that this variety of the mulberry is more hardy than any other foreign kind, even the common white,—and that it yields a silk surpassed by none, it will be a great acquisition to the northern section of the union. We are in a fair way to have a good stock of plants. The 6,000 sold belonging to Mr. Ruggles' estate, and an equal quantity retained by Mr. Rhind, will probably make 100,000 plants the current year; and add to this ten thousand plants sold and retained by Mr. Haight, and the seed furnished by him, and it will be seen that our supply will soon be abundant, if on further trial it shall be found to realize the high expectations which some have formed of its hardiness and excellence.

ROHAN POTATO.

We received several recent applications, by letter, for a tuber or two of these potatoes, which we could not grant, for the reason that we had planted our whole stock. This potato may be had of us, in autumn, in quantities.

ITALIAN WHEAT.

Our friend, Mr. Hathaway, of Rome, persists in cautioning the public, against soaking the Italian seed wheat more than 20 minutes in *strong brine*, lest it destroy the germinating principle. He cites five instances in proof—in one 100 grains were soaked 1 hour, and 42 only germinated; of that which was soaked 3 hours, nine-tenths failed; and of two other parcels soaked 6 and 9 hours, all was killed. Mr. H. ascribes this result to the thin skin of this grain. We repeat that the practice of steeping seed wheat in pickle is common in both Europe and America—that we have practised it nearly twenty years, and that the cases cited by Mr. H. of its injurious effects, are the first that have come to our knowledge.

PEAT OR TURF.

We have sundry inquiries from O. C. Freeman, of Detroit, on this subject, which it is difficult for us to answer, without a better knowledge of the material he describes. The swamp, Mr. F. informs us, has an upper stratum of 14 to 18 inches of what he terms peat, which is underlaid by 3 or 4 feet of muck. He has cut a drain two feet deep. The drain should be three or four feet deep, and below the muck, if practicable; and if this does not lay the ground dry, drains should be made round the borders, and others diagonally from the main one, if necessary. When laid dry, the upper stratum, which we suspect is a compound of ligneous matter, roots and muck, may be either cut and dried, and used as fuel, or converted into manure, by burning, mixing with lime or stable manure. We refer Mr. F. to the three last numbers of vol. IV. for ample instructions upon this head.

SUCCORING CORN.

"Should Dutton corn be succored?" We answer—the same rule will apply to the Dutton that applies to other corn—it increases the *proportion* of sound grain, and somewhat accellerates the ripening process—though it does not, we think, increase the *quantity*, while it sensibly diminishes the *good* forage, and causes additional labor. We do not succor our corn.

STRAWBERRIES.

Some of our correspondents complain, that their strawberries do not fruit, though they flower finely.—R. Hoyt, of Danbury, Ct. has asked us to suggest a remedy. Most of the species of this fruit possess both sexual organs in the same blossom, like the apple; but there is one kind of the hautboy, at least, and perhaps more, that bear these organs in separate flowers, and on separate plants. The male, bearing the stamens, never produces fruit; and the female, bearing the pistil, will of course not fruit, unless within the fruitifying influence of the male, the blossoms becoming abortive.—To prosper well, the two sexes should be planted together, in the proportion of one male to about ten female plants. The selection is most readily made when the plants are in flower, and they should then be marked, to be able to take the due proportion of each from the stole. The male flower is larger than the female, and on examination will be found to be devoid of pistil. As August and the early part of September is the best season for planting beds of this delicious fruit, we propose in our next to give directions for their culture, and to notice some of the most esteemed species and varieties of this fruit.

Mr. Myers, of New-Brunswick, will please forward the *explanation* of his drawing of the *Centrifugal Dessiminator.* We refer to the parts—the letters in the drawing—and the price of the machine.

Acknowledgements.—A bundle of Chinese mulberry plants, and six ounces of Chinese mulberry seed, from D. Hagguston, Watertown, Mass.; Portuguese spring wheat, from L. Ashburner, Stockbridge, Mass. water melon seeds from J. N. Pallain, Georgia; Small's improved plough, from W. Small; Bushnell's improved drill-barrow, from the patentee; gigantic wheat from G. C. Thorbun, New-York; seeds of prarie flowers, from E. Dunn, Esq. Little Rock, Arkansaw.

CORRESPONDENCE.

Freaks of Nature.

Mendon, Ill., May 9, 1838.

SIR—As you are endeavoring to collect and distribute among your numerous patrons, not only all that which is useful and instructive, but also that which is curious and entertaining, I send you the following, not that it possesses either of the above characteristics, but is simply one of those freaks of nature, which so often occur in the distribution of the different varieties of plants in the vegetable kingdom, and which are seldom noticed.

In the month of September last, while engaged in cutting up corn in a field in which the prairie was broke two years before, I observed that there was occasionally a bunch of prairie grass growing, which is often the case if the prairie is not well broke at first, and the future crops well taken care of. On one of these bunches I noticed a number of dwarf ears of corn growing, which excited my curiosity. The bunch of grass grew near a hill of corn, and differed not from other prairie grass, and the corn grew where the grass seeds, if it can be said to seed. The ears were six or eight in number, three or four inches long, rather imperfect in their formation, kernels smaller than those on perfect ears I regret it much that I did not preserve some of the ears and plant this year with prairie grass, out of curiosity, to see their progeny, but it was set up with the other corn, and before I thought more of it, was carried away, and I saw no more of it.

TIMOTHY DEWEY.

To prevent the ravages of Rats in Grain.

How to prevent the ravages of rats in grain after it is housed, has been an inquiry of long standing. We can never exterminate them to such a degree as not to apprehend their incursions, for a horde of these troublesome visitors will often make their appearance when we least expect them. Instinct points the way to where that provision best suited to their nature is found most plentiful. We have often found, when we went to thrash, our oats cut and cleaned by them, and the straw rendered unfit for any purpose whatever, even the subservient one of litter.

But every evil has a cure; and I have found common elder to be a preventive, and have tested its properties as an anti rat application. When the grain is to be packed away, I scatter a few of the young branches over every layer of bundles, being mindful to have them in greatest abundance on the edges of the pile. The drying of the twigs will give the grain an odour not relished by the vermin—which scent in no wise detracts from the quality of the straw for horses, as it makes no difference with them. I have tried it successfully, a number of years, in wheat, oats and corn.

RUSTICUS IN SOLEA.

Improvement of the Mind.

Watertown, May 18, 1838.

DEAR SIR,—I read the letter of Mr. Robinson to Judge Buel, to which you referred me, with pleasure; the object is highly praiseworthy, particularly in a government like ours, where all power is vested in the people. Whatever has a tendency to elevate the character of the working, or productive class of men, adds stability, and a fair promise of durability, to our institutions. Had Adam not eaten of the forbidden fruit, I think each individual of our race would have been engaged in promoting the common good. But it is not so; we are selfish, and all we hope or look for in the best of men, is, that in pursuing their own interests they may select such objects as may also be useful to others, and have a tendency to raise the standard of human character; but I doubt if persuasion only will, or can produce the desired effect.

Men are apt to arrange themselves into two classes: one live by their labor, the other attempts to live by their wits; or, the one earns, and the other appropriates the earnings of the former to their own use, availing themselves of the follies and vices of their neighbors,

as a legitimate means of the appropriation. Nothing would be less like a good general than to trust to his eloquence to persuade the enemy not to invade his territory; his true course would be to make himself strong; and if labor should become honorable and popular here, it must be effected by raising the mental condition of that class who labor. Many benefits would result from such a change. You want to bring to the aid of the farmer and the mechanic a most powerful auxiliary, by enabling him to apply more science and skill to his every day business; you would create in him a consciousness of his own true dignity; you would raise him above petty tricks and frauds, and greatly lessen the drafts upon his earnings to pay the price of litigation. I am well convinced that increased intelligence with the laboring class of mankind, is the only true remedy. For one, I have always considered that man the greatest, and the best, who, by his own exertions, adds the most to the aggregate of human happiness, and I regret with you, that modern habits seem highly to encumber the earth with a very useless set of men. You well say that labor is the origin of wealth. Every thing that administers to the necessities, the comforts, the pleasures and luxuries of men, results from labor. Extend then the benefits of education to the farmer, the mechanic, and producer; and if any man has a child endowed by nature with more than ordinary mental powers, let him early encourage that child in the pursuit of useful industry, and bestow upon him all the advantages of education that his situation permits; the more equal the distinction of wealth, the greater the sum of happiness. Wealth and character are usually more equally distributed where idleness is considered a vice and industry a virtue. I am, dear sir, yours truly,

WM. SMITH.

To preserve Roots in Winter.

Leesburg, Loudoun Co., Va., May 22, 1838.

SIR—The farmers of this county have for the last two years turned more of their attention to the example set by their northern friends, in raising roots. I, for one, was quite successful in *raising* the last year, but lost nearly all during the winter, for the want of a *properly* constructed root-house. My motive in writing this, is to beg the favor of you to give, in your next No. an approved plan for one, on a small or large scale, as your judgment may suggest. Two winters ago I used my cellar for the purpose, but during all damp weather the smell from the turnips was disagreeable, and caused a constant apprehension of sickness.

I am quite a convert to the profitable use of potatoes in feeding milch cows and hogs, and am now preparing for a large crop, which I hope I may be enabled to keep, from the information I may derive from your valuable paper. Very respectfully, your ob't serv't,

W. C. SELDEN.

REMARK.—Root cellars should be constructed under barns, or other out-buildings, with a view to occasional ventilation. When the out-building is upon the slope of a hill, the entrance may be made large enough to admit a cart, or otherwise the roots may be deposited through a hatch-way, or a trap-door in the floor. But the main crop may be best deposited in pits, in dry situations, of three feet or less in width, the roots to be raised to a ridge in the centre, well covered with earth, and ventilating holes made in the crown of the pit with a bar, to let off the rarified air. Roots should not be housed or placed in a pit when wet with rain.—*Cond.*

Rotation of Crops.

Clinton College, Tenn., April 27, 1838.

Hon. JESSE BUEL.—Dear Sir,—Under the head of "Rotation of Crops," in the last number of the inestimable Cultivator, you remark, "We would accept it as a particular favor, and the public would no doubt be greatly benefitted, if some gentleman in the south or west would furnish us with the courses adapted to those sections." Fully impressed with the importance of the motto, "Help one another," and conscious of the *great value of free inquiry and communication*, I am prompted to comply with your request as far as I can; though I should much prefer that the spirit of agricultural improvement in this quarter were sufficiently up to stimulate some one better qualified than myself to give you the desired information.

Indeed, agriculture in this part of the Union has heretofore been so little studied, that the rotation of crops *best* adapted to the nature of our soil and climate is perhaps yet unknown among us. We have, however, some who wish "to improve the soil and the mind," and who have devoted some attention to the improvement of our agriculture: consequently, I am able to give you what I deem our *best rotation*, which has yet been practised here. And here it is but justice to remark, that for improvements of this kind, our people are almost, if not entirely, indebted to the Cultivator and Tennessee Farmer.

In the outset, it may be stated, that experience has sufficiently proven, that the articles of cotton and tobacco cannot be cultivated to much advantage in any part of our state, and that in most parts they are of no profit at all; hence they may be left out of our rotation of crops. Our surface is vegetable mould, strongly impregnated with lime, resting upon a clay substratum.

It is true, we have some mountain land, of a sterile, barren nature, void of lime, and possessing but little mould; but the generality of the inhabited and tillable land is of the kind before given. Thus, nature made our soil fertile, but it has been much deteriorated by neglectful culture: still none of it is so far exhausted, that it may not be reclaimed by clover alone. And this country and climate being by nature adapted to the production of stock and grain, the rotation should consist of wheat, rye, oats, Indian corn, clover, beets, turnips, potatoes, &c.; while our wood lands should be well set in timothy and herds grass for meadows, and blue grass for pasture. Then suppose a farmer have 150 acres of land which he tills. It should be divided by fences into three equal parts; one of which should be sown every year in wheat, rye or oats, (clover and timothy, mixed, being sown with or upon the small grain.) Then the rotation would stand thus in succession: 1st year, small grain; 2d, clover and timothy; 3d, Indian corn; 4th, small grain; and so round again. Thus all the tillage of any portion would take place every third year; and by this plan our lands improve in fertility at a rapid and cheap rate; the clover being always ploughed in when it is two years old. We can here enrich land cheaper and faster with clover than by any other mode of manuring. It is well to remark, that if the farmer choose to sow rye or oats instead of wheat, during the year of transit from corn to clover, he can do so with propriety, for clover will prosper among them as well as wheat; but the point of material importance is this, he ought not to harvest more of them than enough for seed. Because, if he will graze them, from the time they are eight or ten inches high, with horses, cattle or hogs, (especially the latter,) his stock will thrive on them nearly or quite as well as on clover, while they are manuring his land. The grazing should be conducted in the same manner as upon blue grass, clover, or any other pasture.*

In this way, his oats and rye afford as much immediate profit as if they were to ripen and to be harvested; besides, the farmer reaps a future profit in the improved condition of his soil, from the circumstance that the stock fatten the soil while fattening themselves.

It is for the interest of the farmer not even to put a third of his land in corn, as the above system imports; but of that third a portion should be occupied in beets, turnips and Irish potatoes, for these products prosper well here, and are more economical in the rearing and fattening of stock than corn. Then, the farmer would till fifty acres yearly in corn, beets, turnips and potatoes, and each portion of ground would be tilled but once every three years.

It may be well to suggest that all the stable and yard manure should be *put in the hills or drills* of corn, beets and potatoes, instead of spreading it broad cast.† By applying it to the hills, or immediately where the plants require it, *all* that is put on the ground is of *immediate* benefit to the crop, and thus too you are enabled to supply each plant more abundantly than a given amount of manure would otherwise do. Your turnips, if sown broadcast, must of course be manured in the same way; but if in drills, the manure should be also in the drills. By thus manuring in the hills or drills, your immediate crop is increased to the highest perfection in your power, while you are thus enabled to keep less ground to obtain a given amount of produce, so that more of your land can be in clover, yielding a profit, while it is undergoing a cheaper and more speedy fertilization. Lime should be spread broadcast upon the high points of the field, where the soil has been washed away.

Thus, hastily, I have given our best rotation, and I must conclude by asking you some questions.

1st. What are the best authorities on horses, sheep, and swine? Can they be had in Philadelphia; if not, where?‡

2d. What is the price of Berkshire pigs, and how could they be transported to Nashville, Te.?§

3d. Is the constitution of the State Agricultural Society of New-York published in pamphlet form or otherwise? If so, please send me a copy. If not published, the western country would be benefitted by the publication of it in the Cultivator.‖

With high regard for your efforts, I am, sir, your ob't serv't, FRANCIS H. GORDON.

The improvement of the Mind leads to the improvement of the Soil.

Farmington, May 19, 1838.

J. BUEL, Esq.—Dear Sir—One of your correspondents, Mr. Robinson, asks what can be done to elevate the condition of the cultivators of the soil?

The zeal he evinces in his communication to you on the subject is worthy of all praise, and his suggestions may be the means of awakening a spirit of inquiry, and thus be the means of effecting much good.

It is true, the *farmer's* calling has been despised, and mainly, as I believe, because the ignorant and refuse of the people were principally the operators, and because the profits of the business were so small, as not to tempt the active and enterprising to engage in it. If I am right in this view, the remedy is plain; it is, to induce men of intelligence to enter into the business, and to make it in a pecuniary point of view profitable.

Now if the mass of the people can be made to see that the cultivation of the soil is equally profitable, or more so, than mechanical business, we shall find no lack of hands, and of the right sort too, to engage in it.

Science, applied to agriculture, has, in England and Germany, effected this object. The new system of husbandry introduced there is not only enriching their soil, but it is gradually making it the most profitable business of all. The dissemination of knowledge here then, and the inducing educated men to enter upon the business, are the means to be used to produce the desired results. Newspapers devoted to agriculture are the vehicles to be used to convey this knowledge to the people; these should be encouraged; every subscriber should induce his neighbor to take one, and use every honorable means to increase the subscription list and extend the circulation, that the conductors of such works may devote time, and labor, and knowledge, and talent, to make them worthy of patronage.

I have thought, instead of forming agricultural societies, (the benefits of which for the most part are temporary,) a more permanent source of good would be to endow agricultural schools, where young men would be sent to acquire knowledge, and to study the art as a science, where practice should be united with precept, where *professors* of every branch of rural economy would lecture, and where every means should be used to instil into the minds of the students a love of the science, and to fit them to be useful to themselves and to the community. To such institutions the rich would be induced to send their sons, as not only invigorating their minds and bodies, but as a means to acquire an accomplished education. The poor, as giving them an useful education, and to enable them to make their way through life; and thus should we rear up educated men, well imbued with this peculiar knowledge, many of whom would choose agriculture as their business, and devote their lives to the improvement of their profession, and thus produce the results your correspondent seeks for.

It is by knowledge thus applied in Europe, that agriculture has made such advances there, and with the enterprize and perseverance of our people may we not hope to overtake our fatherland, and even rival it in improvement.

And why should we not have such schools to teach the art scientifically? Is it not the first and most important employment—that on which all others most emphatically depend, and a thorough knowledge of which is more difficult to obtain than almost any other, and requiring a capacity, too, to master it, of as great a stretch as any other? but having once acquired such an education, the field is open for talent and enterprise in which a rich harvest of honor and usefulness may be reaped; and the successful occupant of which may acquire more solid renown than the great leader of armies, or the statesman at the head of the councils of the nation.

If you should find any thing in these suggestions of any value, you are at liberty to use them in the way you shall deem best. My object will be obtained if any thought I have expressed shall prove a stimulant to others to aid a cause which in its results will be so cheering to our country.

I think I can already see a spirit arising in our land which will not scorn to labor until our land shall become eminent in this branch of knowledge.

Respectfully yours, EGBERT COWLES.

Mode of preventing or curing the Murrain.

In p. 68 of our last vol. we published a communication from J. Smealie, descriptive of a fatal disease which prevailed among cows. Our remarks upon it will be found in p. 79. That communication induced a Maryland farmer to inform Mr. S. *how to save his cows*. After repeated trials of the prescription, Mr. Smealie has had ample proofs of its efficacy, and has sent us the correspondence, which we insert below.—Thus, it will be seen, the Cultivator has been a means of saving several valuable cattle; and the letters which follow, we have reason to believe, may be the means of saving hundreds more.—*Con. Cult.*

Union Town, Carroll co., Md., June 12, 1837.

RESPECTED STRANGER,—In the last Cultivator I saw your letter, describing a disease which prevailed among your cows. My object in writing to you is to inform you of a preventive of disease, which I have used for the last two years with success. It is simple. You may try it if you think proper. I tie my cow in the stable, then let a strong man hold her by the nose and horn, then take the paddle we commonly use for greasing the wagon, dip it in the tar bucket, taking up as much as will stick to it, say from a gill to half a pint, open the cow's mouth, and put it as far back on her throat as possible without hurting her; hold the paddle in her mouth long enough for her to work the tar off of it. I do the same to every cow, and repeat the operation every two or three weeks the year through, at the same time rubbing a quantity of tar about the cow's

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* This is a new, but, we are inclined to think, a good, suggestion.

† We must dissent from our correspondent. Manure is intended not only to benefit the crop to which it is applied, but subsequent crops. And *where* does the corn crop want it? In the circumscribed space occupied by the hill? The roots, which take up the food, soon extend beyond these limits; and we think that if dunging in the hill gives the greatest *immediate*, spreading the manure broad cast imparts the greatest *ultimate*, benefit, even to the corn crop; and that it benefits most if spread, and commingled with the whole stratum of soil.

‡ "The Horse," by the British Society for promoting useful knowledge, is one of the best works upon this animal.—The same society have made a valuable publication on sheep. Both of these books can be obtained, no doubt, through Judah Dobson, bookseller, Philadelphia. We know of no distinct publication upon swine, though most of the British agricultural writers treat of them.

§ See Bement's letter in No. 3 of the Cultivator; for price. They might be sent to Nashville by water, via Lake Erie, the Ohio canal, &c.

‖ This request shall be complied with.

horns and face, forehead and nose; likewise smear plenty of tar about the manger and troughs. Before I commenced with the above remedy, I lost a number of my best cows, but we called the disease the horn distemper or murrain. I have had cows taken when in fine order, I might say almost fat enough for beef; they would linger a few days and die—the horns when examined would always be hollow, and mostly dry—urine sometimes bloody. From the circumstance of your cows voiding bloody urine, I think it evidently the murrain your cows are afflicted with. It is a distemper caused sometimes by cattle drinking impure water. I would advise you to try it, always bearing in mind that it is necessary for the cow to swallow a good portion of the tar. Since I have used the tar, about two years, I have not had one of my cows diseased in any way, and one of my neighbors, whose cows were formerly diseased, has used it for a long time with the most complete success. I give the tar to horses, sheep and hogs, and think it good for them.

If you should think it worth while to try it, and should succeed, I would be glad to hear from you, that is, after you have tested it fully. Direct to Union Town, Carroll county, Maryland.

Since writing the above, I think it necessary to state, that I do not think the tar will be so likely to cure a diseased animal, but as a preventive of disease among stock of any kind I think it unrivalled, particularly for cows.

Your friend,
JOSEPH COOKSON.

Princetown, Schenectady Co., April 21, 1838.

DEAR SIR,—Ten months have nearly elapsed since I received your letter in reply to one of mine which was published in the June number of the 4th vol. of the Cultivator, giving an account of a disease that prevailed among my cows, which I did not then know was what is called *murrian*, until informed by Judge Buel and yourself. My object in now writing you is, first, in accordance with your own request; 2dly, to return you thanks for your promptitude and kindness in writing me, which I now do unfeignedly and gratefully; and, 3dly, to inform you of the success of your prescription, not only in my case but also with several of my neighbors. I can now go a step farther than you ventured to do, that is, I can recommend the use of tar, not as a preventive only, but also as a cure for the above disease. You will be able to judge from the following facts: I commence[d], according to your directions, immediately on the receipt of your letter, from which time back to the date of mine already referred to, none of my cattle had been taken sick, but in three or four days after they had received the first dose one of them was seized. I first observed her in the morning, and immediately gave her another portion, perhaps double in quantity to what you recommend. At night she appeared to be no worse, but I gave her yet another dose; next morning she was evidently much better, and soon got entirely well.

This was the last sickness of any kind to which any of my cattle have been subjected. The distemper has prevailed in this neighborhood, more or less, for a number of years, very few recovering; and where it found its way among a stock, it has sometimes swept the whole which the owner possessed. Application was made to me by three of my neighbors, to all of whom I recommended the use of the tar, and in every case the result was a complete cure. The first, (who like myself had been contending with the disease for a considerable time,) had a cow so far gone that she was unable to stand, and was blind, yet, contrary to all expectation, on a liberal application of the tar she recovered. Another had one of his cows violently seized, (he well knew the trouble as an old acquaintance, it having nearly swept him once before,) he applied the tar a few times in large doses, and she soon recovered. Another had lost two cows, but since he commenced giving tar, which is about six months, the others have remained in good health. These are the only cases that have come to my knowledge, but the result has been uniformly such as I think will warrant its publication.

Your letter has been read in the office of the Cultivator, and the result of your prescription in my own case has likewise been stated. A request has also been made for your letter for publication, which I have promised, on condition that you make no objection, which I think very improbable, after your prompt communication to an entire stranger. I will, however, wait until the last of May, and if I do not hear from you before that time, your letter will probably appear in the June number.

I am, dear sir, your much obliged well wisher,
JAS. SMEALLE.

Mr. JOSEPH COOKSON.

Corn Stalk Fodder.

Knoxville, Tenn., May 13, 1838.

J. BUEL, Esq.—Sir,—Our farmers generally pursue the old plan of stripping the fodder off the corn stalks, whenever the corn is sufficiently matured to do so.—The stalk is very seldom cut off near the ground, and we know very little of saving corn and fodder in that way.

I have been under the impression that the blades would become so much dried before the corn would be sufficiently matured to cut up, that the fodder would be of little value. I would be glad of some additional information on this subject, and also as to how long the stacks are left standing in the field after cutting?—Whether the corn is taken off the stalk before housing? and any other information on this subject you may please to communicate in some subsequent number of the Cultivator. Very respectfully, your ob't serv't.
MAT. McCLUNG.

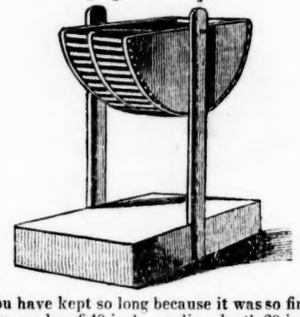
REMARKS.—Our practice is, to cut up our corn as soon as the grain becomes glazed, or hard upon the surface—while the leaves and stalks are generally yet green and succulent, and to set it immediately in stooks. Being gathered in this succulent state, and protected in the stook from the injurious effects of the weather, it dries moderately, and retains most of its saccharine and nutrient matter. The corn may be picked from the stalk in twelve or fifteen days, if the weather is favorable, though the stocks require a longer time to cure, before they are housed. When the corn is taken off, we put the stalks into small stacks, so as to expose all the but ends, which have become wet by standing in the fields, to the drying influence of the winds. The grain unquestionably derives more benefit from the stalk after it is cut up, than it does from the stock, after the latter has been stripped of its leaves, its elaborating organs, as practised at the south. The stook, containing 80 to 90 stalks, is tied above the ears, which latter keep it sufficiently open to prevent the grain heating or moulding. It should be remembered, that our corn stalks are pigmies, compared to those which grow in Tennessee. See a memorandum of our experiment at p. 142, in our 4th vol.—*Cond.*

Potato Washer.

Yorkville, Whitestown, April, 1838.

J. BUEL,—Sir,—I send by the bearer a model apparatus for washing potatoes and other roots. It is an old affair, therefore I am so much the more vexed to still see brother farmers washing their potatoes in boxes, troughs and baskets, when for the value of one good oak basket they can construct a washer that will last 15 or 20 years. The cheapest way is to take that rude

[Fig. No. 38.]



plank you have kept so long because it was so fine, and strike two circles of 40 inches radius, depth 20 inches of course, and saw them out; now take one of your old barrels, if oak so much the better, the staves are exactly the right shape, a little too long perhaps, 28 inches is long enough, place the heads or ends that distance apart, and nail on the staves three-fourths of an inch asunder, over which nail three strong hoops, one on each end and one in the middle; now bore a two inch hole in each head two inches below the compass dot, through which put a shaft, which may be put through or notched on to two posts; the posts may be set in the ground, or, if it is desirable to render the whole moveable, they may be attached to a timber or plank floor. There you have it, now we will try it. Pour the potatoes in over one end to keep its equilibrium, then dash on a bucket of water, and facing one end, and with a hand on each side rock it to and fro, so slow that the potatoes follow the motion; when they appear to be all wet, put in another bucket of water and let them drain; so tip it down, (it being high enough to set your basket under,) and they will slide out freely. With a washer of this kind, any one who can carry a bushel of potatoes can wash, with two buckets of water, two bushels in less than two minutes.

It is obvious that it will wash ruta bagas, beets, &c. equally well, and apples also. There you have my account of the matter; but it is no use to say so much about it; my neighbors see me using it frequently, and acknowledge it is a grand thing, and then go straight home and continue the use of their baskets and troughs as before. 'Tis this that vexes me, because every one of them can make one if they will.

Respectfully, H. G. BALIS.

P. S. I wish to ask you one question. If my basket will hold a bushel of grain even full, ought it to be considered a fair bushel of potatoes if I fill it heaping full? [Yes.]—*Cond.*

Cure for Ring Bone.

Mr. EDITOR,—Are we not individually called upon, when we become acquainted with any knowledge which by a more extended diffusion will promote the interest and welfare of those around us, to make known the same to the public?

Feeling this to be a duty, I would direct the attention of all gentlemen who are raising horses to that distressing complaint, viz. the ring-bone.

Having in the early part of my life paid considerable attention to the raising of horses, but finding them subject to so many complaints, and especially that of the ring-bone, I was much discouraged in the enterprise, and was led to ascertain, if possible, the causes of that complaint, and if any remedy could be found. From all the information that I could obtain from different authors on the subject, and from my own experimental knowledge of the complaint, I was led to conclude that there were various causes for the complaint—that colts which are kept confined in a stable, and the floor cleaned off daily, are more liable to be affected with ring-bones, than those that are kept on the ground or on floors well littered. Low keeping, by weakening the joints, has a tendency to produce them. In young horses they are generally occasioned by sprains, which are made by being rode or drove too hard, running in the pasture, or leaping fences.

After hearing the above statement as to the causes, the reader may with propriety inquire, what composes the ring-bone, and whence does it originate? In answer to this inquiry—I have found it to be composed of the synovia or juices of the ankle or fetlock joint, which, by some of the forementioned causes, is made to flow or leak from the joint, and is at first collected into a small sack in the back part of the fetlock joint; from thence it is conveyed by two small tubes to each side of the foot, where it gradually forms the callous or ring-bone.

For the last thirty years I have been in the habit of successfully performing an operation, which prevents the ring-bone from increasing in size, and if not lame previous to the operation, the animal never after becomes lame in consequence of the ring-bone; but if lame before the operation is performed, a period of from one to twelve months is required for their recovery, much depending on the length of time which they have been lame.

The operation is performed in the following manner. I first shear off the fetlock, then make an incision thro' the skin and extract the sack above mentioned, at the same time taking care to destroy the communication from the joint to the ring-bone, by cutting off the tubes or conveyors from the joint to the ring-bone.

If the aforesaid operation is performed skilfully, the horse is as fit for use in one week as before.

ZECHARIAH CONE.

Hebron, Conn., March 26, 1838.

REMARKS.—Dr. Willich says, where the tumefied part is distinctly perceivable round the pastern, without affecting the coffin joint, it is easily cured, but if the swelling be of long continuance, and has become hard, it may then require both blistering and firing," i. e. searing with a hot iron"—Extend a mild blister over the cauterized part.

Importance of Agriculture—to all.

Stroudsburg, 23*d May*, 1838.

DEAR SIR,—Although not a farmer by occupation, yet there is no department of human industry regarded by me with so deep an interest, as that of the cultivation and melioration of the soil. The sad experience of the few last years has brought us to feel how immediately we depend upon the humble calling of the husbandman for the daily supply of our most pressing wants. Under Providence, society looks up to the farmer; who holds in trust the elements, not only of human comfort, but of existence itself. How important then is the business of agriculture—and, I will add, how respectable too. Yes, sir, how respectable, *in itself*, and in the *public estimation*. Among private citizens, I know of none more worthy of honor than the industrious, intelligent and virtuous farmer—and to such a man, notwithstanding his plain garb and hard hand of labor, I would sooner bow, than to a score of genteel loungers, who contrive to "lash the lingering moments into speed" by novel reading, hunting, fishing and the like.

But the farmer, in order that he may receive honor from those only who can confer it, must have *intelligence*, hence he must *read*, for no man in these days of improvement and experiment can keep pace with society unless he adds the experience and observation of *others* to his *own*; and this is to be done by reading, reflection and experiment. Hence the utility of well conducted agricultural journals—and such, sir, without intending flattery, I would denominate yours.

When I sat down, I intended to touch a subject on which I would be glad to see some remarks from yourself. In every district of country where I have resided, a general belief prevails of the influence of the *moon's phases* on vegetation, as well as on various other things, together with a belief in the important influence of the *signs*. Now if these influences are only imaginary, as I suppose them to be, it is a matter of some consequence that the farmer should settle that point in his own mind. If error it is, it is by no means a fruitless error. Bad consequences, at least sometimes, may follow. Take an instance. A farmer has prepared his ground for Indian corn. It is in good condition; the season has come round, and all is favorable—*except the sign*. He must wait a week, perhaps, for the sign to travel on to *aries*, in order that the ears of his anticipated crop may correspond in length with those members of the body. When at last the golden moment arrives, sad to state, a rain has set in, which, had he committed his seed to the ground in season, would have been most favorable to its early germination; but, as matters are, it may put to hazard his whole crop, in those latitudes where a week's difference in the accession of the first autumnal frost will often make the difference of harvest or no harvest.*

* The moon has unquestionably an influence upon vegetables and animals, as well as upon the ocean of waters; but we have never seen it attempted to be maintained, by men of scientific knowledge, nor have we ever believed, that one phase of this planet was more favorable to the deposit of seeds in the earth than another phase; and as for *signs*, the only one that we ever wait for, after our ground is prepared, and the season of planting or sowing arrived, is that of *good weather*, which we are sure to improve; and seldom fail of realizing good crops, whether the moon, at planting, be in *aries*

But I will not enlarge—leaving this subject with you, and wishing you all that success and enjoyment which labors like yours deserve, I am, with great respect,

Yours, &c. WM. P. VAIL.

JESSE BUEL.

Joint-Murrain, or Garget.

JUDGE BUEL:—A disorder has prevailed among cows in this vicinity, for the last twelve or fifteen years, which I have never seen described, and which baffles all attempts at immediate cure. It generally attacks young cows in milk, and rarely extends to any other stock.

The animal is taken suddenly lame, generally in one foot, but is soon lame in all. No local inflammation is perceptible. Slight costiveness and some fever generally attend it. On examining one recently, I found the hip bones carious to such a degree, that they might be cut with a knife. The spinal marrow was dissolved to a watery substance in the vicinity of the diseased part. The animal had been helpless in its hind parts for a month before it was killed.—The rotten bones were broken from the spine. Frequently the disorder commences in the fore feet. I have never examined one thus taken.

Cows in high flesh are as liable to the disorder as any. In some instances, it has been cured by drying the cow immediately; in others, this remedy has failed.

Having never had any of my own cows affected with the disease, perhaps I cannot describe it so minutely as some others—the above, however, are the general characteristics. Can you, or any of your correspondents, give information as to the cause of it, or suggest a preventive or remedy? If so, you will advance the cause of agriculture in this section of the country, by giving it publicity through the columns of the Cultivator. J. K. SMITH.

Dublin, N. H. June, 1838.

REMARKS.—We are not skilled in the diseases of cattle; and we are satisfied that we are suffering immense losses annually, in the death, by diseases, of our domestic animals, which might be avoided, had we schools, like those of Europe, to teach and promulgate correct knowledge in the veterinary art. Having no resource of this kind, to apply to, we avail ourselves of such authorities as we have at hand, to answer the questions of our correspondent, and invite further information from any of our readers who feel competent and willing to impart it.

Lawrence has grouped together a number of diseases, all of which, he says, indicate the same disease in different stages. These are known by the popular names of *shewt of blood—vomit of blood—blood in the back—blood in the legs or cratench—blane in the tongue, or overflow of blood—striking in or rising of the blood—higham or iron striking*—JOINT MURRAIN OR GARGET—*black quarter—quarter evil—black leg.* "All our animals," says he, "oxen, sheep and pigs, I have observed, are subject to sanguineous effusion, or overflow of the blood, on being put, when in a low and weak state, to rich or succulent keep. One termination of the disease is by a deposition of matter upon the joints, whence the term of joint garget or murrain." "This disease has swept off great numbers of yearling and two year old cattle, and become indeed endemical, in certain districts, where any such scourge was unknown, it is said, previously to the introduction of artificial grasses, with the full feeding on which, the animals become surfeited; thus the improvident use of good produces evil."

"Prevention of this malady is the only cure worth notice, because after the attack, the very nature of the case renders all remedy either uncertain, or of very little profit. even if successful, on account of the expense of time and money. With this view the young cattle must not be put so forward in condition, and indeed the same precaution may be useful, in some degree, with respect to the full aged. Those observed to advance very fast, may be bled monthly for several months, or may be purged with six drachms, daily, for a month, of equal parts of sulpher and antimony, in fine powder, OR SALT MIGHT BE OF USE. Rowelling also might be an efficacious preventive. Keep two rowels or setons open in each breast during several months. The disease having fallen on the joints, the best cure, I should apprehend, is to kill the beast, but if that will not agree, I am aware of no better method than to take him home foment his joints, and give two or three brisk mercurial purges." See Lawrence upon cattle, London 2d ed. p. 294, &c.

Prevention, we all know, is better than cure; and if we would profit by this adage, we should make the transitions from low to high feed, in our domestic animals, slow and progressive; and give them DAILY ACCESS TO SALT, a condiment as essential to health and comfort in the daily food of the brute, as it is in the daily food of man. The best authorities, and most experienced farmers, concur in the opinion, that salt is the grand preservative of health to domestic animals.—To test its value of the animal, daily, let any one take it in his food only monthly, weekly or semi-weekly, as he is accustomed to dispense it to his stock, and he will soon become a proselyte to our belief.—*Cond. Cult.*

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or *places*—in the ram or the fish. The superstitions you mention belong to a by-gone age, when seeing the new moon over the *left* shoulder was deemed an infallible sign of ill luck.

On Summer Fallowing.

Schaghticoke, June 5th, 1838.

SIR—With a desire to gain information, permit me while I give my own, to ask your opinion as well as that of some of your numerous correspondents, upon the subject of summer fallows. 1st. Are they ever beneficial to the land or crop which it is intended to produce? 2d. If beneficial, are the benefits an equivalent to the enormous expense attending them? 3d. Would not a clover sod be a better preparation for wheat than the naked fallows? Satisfactory answers to these queries, I conceive to be of immense importance to your readers. Some of the agricultural writers of Great Britain, contend that the general abandonment of the naked fallow system in that kingdom, has tended more to produce the high stand which her agriculture now sustains, than every other improvement combined. If such is the fact in relation to Great Britain, why would not its abandonment in this country be attended with a like good result? Look at the immense expense in preparing our lands for wheat. Our farmers, by the course they pursue, are not only at the expense of one or two extra ploughings, but lose the use of their lands through the summer, which could be made to support an immense number of cattle, and thereby greatly augment the profits of these farmers, and increase the quantity and improve the quality of those manures, which have been rightly termed, "the magic wand that the farmer uses," and upon the production and just application of which not only depends our immediate interests, but the high reputation which we hope ere long to see our agriculture sustain. "Nature seems to require no rest, and the earth was evidently designed to produce a constant uninterrupted vegetation." If then the productive quality of the earth never ceases, why should this principle of nature be perverted, and our lands laid bare and exposed to evaporation, instead of being covered and protected. One argument often produced in favor of the fallow system is, that it cleans the land from weeds. Tull, in speaking of the British fallows, said, they presented nothing but a conflict between the farmer and his weeds, in which the latter generally prevailed. Our lands well laid down in grass, are free from weeds, and why are they not in as good a condition to receive a crop with one good ploughing as a half a dozen? It is a fact incontrovertible, that the decomposition of vegetable matter produces food for plants.—By summer fallowing, the vegetable matter is all decomposed and evaporated before the crop is put upon the land. The old school of farmers tell us that the sod should be well rotted before the soil is fit to receive the seed. This idea appears as absurd to me as that straw should be reduced to a powder before we apply it to our soils. The general practice which has been pursued upon the wheat farms in this county, is to sow wheat every other year after summer fallow, until the occupants found that their lands would no longer produce wheat. It would have been millions in their pockets had they pursued an alternati.e system, and known that it was the fallow, not the wheat, that so soon exhausted their lands.—Wheat farms should be made stock farms. Every farm of 200 acres, by alternating wheat and clover, and cultivating a few acres of roots, can be made to support more stock than 100 acres upon which a plough is never used, as the straw would help to winter them, and with the increased quantity of manure, their crops would, in a few years, be doubled, and the soil continually enriched. I have been perfectly successful in raising wheat upon a clover sod; and so fully am I convinced of the bad effects of summer fallows, that unless this mistaken kindness towards the wheat crop can be abandoned, I believe it would be a benefit to this country should the wheat insect spread over every part of it, and leave us dependant upon the eastern world for this part of our bread stuffs. Yours, with respect,

J. C. MATHER.

REMARKS.—The reasoning of our correspondent is sound, and its correctness is verified by results of all who have given a fair trial to fallow crops, as a substitute for summer fallows. The only cases, in our opinion, where naked fallows should be tolerated, that is repeated summer ploughings given for a wheat or rye crop, is where the soil is a stiff wet clay, which will not grow clover, and lands which abound in fibrous, woody matter, when first reclaimed by draining. Good draining, and especially what is termed furrow draining, will supersede the necessity of summer fallowing wet and stiff clays, and vastly improve the texture and productiveness of the soil. If such grounds are ploughed in narrow ridges in autumn, and the furrows well cleaned, that the surplus water may pass off, they may be sown with oats early in the spring, and be in fine condition for winter grain in September. The difference in profit between the two modes of converting sward into wheat, may be stated thus: The three ploughings and harrowings for summer fallow, may be estimated at $8, and the use of the land is virtually lost for the season. In the other mode two ploughings suffice, for the oat and wheat crop, thus saving at least $2.50 of the outlay—while the oat crop, if any way tolerable, will make a return of twelve or fifteen dollars additional. The land will be richer, and in better condition for wheat, because it will retain the vegetable matter of the sod, than if it is summer fallowed. The fertilizing matter of the sward is exposed and wasted by the cross ploughings. To render a fallow a cleaning process, it is customary, in Britain, to pick and gather, after the harrowings, the perrennial roots and quack-grass, and to burn, or mix them with the dung—a labor which our farmers seldom or ever incur.—*Cond. Cult.*

EXTRACTS.

Character of Dutton Corn.

We copy the two following articles from the Hartford Times, at the request of a respectable correspondent.

Mr. EDITOR—An article has been copied in several papers from the Springfield Republican, commending in the highest terms the *Dutton or Canadian corn.*—Had not the writer of this article been explicit in his statements, giving names, dates, &c., the agricultural portion of the community would have considered it a gross imposition. We saw the article advertised last spring, perhaps in your paper, as peculiarly adapted to this cold region, sure to ripen three weeks earlier than the "old fashioned" corn, &c.

In common with many of my neighbors, I repaired immediately to the advertiser, bag in hand, and as a special favor, at the rate of *four dollars* per bushel, obtained a few quarts. Our children and friends looked at it as one of the great discoveries of modern times, and it was no effort of our imagination to see the fruits of it early in store, long before the appearance of autumnal frosts. I planted it on the 18th of May, in my garden, and at the same time, and adjoining, planted an equal quantity of the "old fashioned" corn. As the ordinary time arrived for family use, I looked, but looked in vain, for the ripening of the Dutton corn. My faith, however, did not fail, until the 4th of October, when, after the old fashioned corn had been ripe more than two weeks, this *celebrated* corn was in the milk, hardly ripe enough to roast. The frosts came about this time and destroyed it, and with it all my confidence in Dutton corn.

Now, sir, if this was the result of my experience alone, there might, perhaps, be some question as to the fairness of the experiment. But since reading the article alluded to, I have conversed with at least six of my neighbors, whose experiments and opinions on this point correspond with my own. If necessary, we are willing to give our names, and think it our duty to express our opinion, that, as regards this section of country, at least, it is an imposition to recommend it. It may seem a slight matter to the "soft handed," who labor by proxy, but to those of us who earn our bread by the "sweat of our brow," it is not only a serious loss thus to plant and not to reap, but it is exceedingly mortifying and provoking.

For a time we thought of prosecuting the advertiser, but we consoled ourselves with the idea that as "monsters cannot beget their own species," no more seed of this kind would very soon be offered to the public.

A LITCHFIELD COUNTY FARMER.

Mr. EDITOR,—In your paper of the 12th inst. I noticed an article signed "A Litchfield County Farmer," giving a somewhat ludicrous account of his experiment, and of those of six others of his neighbors, in planting and *attempting* to raise that variety of Indian corn now known by the name of the Dutton corn.

It is to be regretted that when gentlemen undertake to place before the public any statements, respecting their own experiments in agriculture, by which any benefit may be expected to result for the common interest, that they withhold their names from the publication of facts, on which their opinions are formed, and their conclusions drawn—leaving the reading part of community at a loss what degree of credit ought to be attached to such anonymous statements.

That frauds and impositions have been practised by certain persons, in selling seed corn under the name of Dutton corn, is well known; but these very frauds go to establish the truth of the fact that this variety has acquired a distinguished reputation, after several years trial by the most experienced farmers in our section of the country, and of course greatly raised the price of this seed—witness the "few quarts" bought by the "Litchfield County Farmer at the rate of *four dollars* per bushel."

I have, Mr. Editor, no other interest in this subject than that of an ordinary farmer in raising corn for my own use. Such have been our seasons for several years past, that I, with many others, have been solicitous to obtain a variety of that useful article which should arrive at maturity as early as might be, to avoid injury by our autumnal frosts. In these endeavors I have succeeded beyond my expectations. I will now state the facts.

In the spring of 1837, I bought of Mr. St. John, of Hartford, a small quantity of the Dutton corn for seed. On the 28th and 29th days of April, I planted in one field sixteen acres—eight of which with the seed of the Dutton, and the other eight with the seed of the common yellow, or, as is denominated by the "Litchfield County Farmer," *the old fashioned corn.* The land throughout was of the same quality, and had the same tilth and culture. The Dutton was fully ripe and fit for

harvesting 16 or 18 days before that of the common yellow—not an unripe ear, nor any mixture of refuse, or what is commonly called *pig corn*, was found among it—whereas among the eight acres of the common yellow, one-third part of the whole was, by reason of its immaturity, thrown by as *nubbings* and *pig corn*, wholly unfit for market. I carefully measured in a half bushel one hundred of ears of the Dutton corn and shelled it. The quantity of the shelled corn was half a bushel and three pints—the weight of the half bushel was thirty-four pounds. Those of my neighbors who planted the same kind of seed the last season, experienced much the same results.

I have now to propose to the "Litchfield County Farmer," that if he will take the trouble to honor me with a visit, I will give him "a few quarts" of the *true* Dutton corn, and let him plant it on the same kind of land as that on which he plants his "old fashioned corn" and give it the same husbandry—if the Dutton corn does not come to maturity at least 14 days earlier than the other, I will pay him for the time spent on the journey two dollars per day, and keep him at my house free of expense to him.

I have now only to add, by way of statement, that, from careful observation, I am prepared to say, that, supposing the season to have been such as to have brought the eight acres of the *common yellow* to maturity without any injury by frost, the quantity would have been one-third less than on the other eight acres.

In conclusion, I think it cannot admit of doubt, that the "Litchfield County Farmer" was imposed upon in the "few quarts" of seed purchased by him. His doleful story of the disappointment of himself, his "children and friends," in their raised expectations of the luxury of the Dutton corn, reminds me of an historical incident, not altogether unlike in its character to the case of our "Litchfield County Farmer."

At an early period of the fur trade between the Hollanders and the western Indians of our country, the Dutchmen bartered off at an enormous price a quantity of their gun powder for beaver. At the close of the trade for the season, when the pale faces were about to return, they informed the Indians that they had a small quantity of *gun powder seed*, which they would sell, in case they could receive a price adequate to its immense value—assuring the red skins that by careful planting and good cultivation, they would be enabled in future to raise their own gun powder. The bait was greedily swallowed, and the purchase made by large piles of beaver skins. The Dutchmen soon took themselves off. The Indians prepared their ground and sowed the seed agreeably to the directions given. After waiting a long time for the expected vegetation of the seed, they examined the ground by digging down, and the trick was discovered.

The purchasers, with their *papooses and friends*, were overwhelmed with disappointment and chagrin, greater, perhaps, than have been endured by the "children and friends" of the "Litchfield County Farmer."

East Granby, May 18, 1838. HORACE CLARK.

Books on Agriculture, for School Boys.

We have thought the cause of agricultural improvement would be greatly promoted by the publication of a series of elementary books on agriculture, designed for the use of the schoolboy. Why should not our children have facilities for the acquisition of knowledge applicable to this pursuit as well as on less useful ones? If education is designed to fit us to engage in the practical duties of life; why is it that the most important of all earthy subjects, and one which occupies the labors of a vast majority of our people, is not the leading object of the schoolboy's education? We have elementary books on every other subject; we have schools wherein are taught the rudiments of every science, schools of law, medicine, divinity, of fighting, dancing, and of every thing but of agriculture. There is something wrong in the national practice on this subject. We ought to give to the most important subjects the highest degree of attention—we must graduate various branches of education by the standard of their relative importance, and give to those having the nearest relation to our most important interests, the greatest share of favor. We ought to have the principles of husbandry taught in every common school and a chair of agriculture endowed in every college. And we think the first step to the introduction of this new branch of education is, to have the necessary elementary school books. We have many men in our country, eminently capable of compiling such works and adapting them precisely to the capacity of the schoolboy.—And he who would prepare a set of works on agriculture for the use of schools, such as would give to the boys of the country destined for the pursuits of husbandry, a thorough knowledge of the principles and the outlines of the practice of agriculture, would do more for the general good and for his own literary fame, than in any other walk of science or learning. Let it not be supposed that we decry other branches of science or learning. We are in favor of all; and especially those which contribute useful aids in the practical labors of life. We would render all subservient to man's use; and it is only in this view that they should be appreciated. But it is admitted on all hands, that agriculture is the most universal, the most dignified, the most congenial, virtuous and productive pursuit of mankind—the substratum of all other pursuits—the life and soul of commerce and manufactures—the mother of the arts and sciences—the basis of civilization; and we insist, it is *not* seeking too much when we seek to give to her own child, the husbandman, a higher grade of education. Whatever description of knowledge, relates nearly or remotely, to the multifarious labors of the agriculturist, should be an object of his study, and constitute a portion of his exercises at the primary school and the college, and employ his reflections in all the riper years of after life. One of the most absurd and mischievous errors of the day, is that of the father, who gives to the son destined for a farmer an education inferior to that he bestows upon the one destined for a profession. The husbandman deserves a better education than a lawyer or a doctor; because his occupation requires the exercise of more knowledge; but it is too generally the case, that he is only allowed some snatched intervals between the crops, "to learn to read, write and cipher"—and this is deemed education enough for a farmer! O, what a wretched, miserable error is this—what a foe to the improvement and dignity of the class! It ought, it must be banished, and the practice which results from it abolished, and a wiser and better one substituted. Now, however the remark may seem to censure the general opinion and practice on this subject, and although we may be even ridiculed by many farmers themselves, for the apparent ultraism of the sentiment, we are bold to declare, nevertheless, that the farmer *has need* of a better education, and he actually more often requires the aid of more various branches of science in his ramified operations, than the member of *any* profession; and we sincerely believe, that if any discrimination should be made in the education of two sons, one destined for a farmer and the other for a profession, it should be in favor of the former. Let us not be misunderstood—the boy destined for a profession or trade should be thoroughly educated in all branches pertaining to his distinct calling; while the boy intended for a farmer should be thoroughly instructed in all the principles to which the intelligent and scientific agriculturist stands indebted for the successful result of his labors. We could easily show, that these principles are drawn from a wider range of sciences than are necessary to be consulted by one destined for any of the so-styled *learned* professions; and consequently it would be shown that the husbandman needs a more extended education. A young man preparing for the bar is ready to enter upon his legal studies on attaining some smattering of Latin, (or it may be Greek); and many do not even go thus far before taking up Blackstone. A short course of reading elementary works on the principles and practice of law, and the student enters on the practical field of his profession. The physician requires more preparation to qualify him for practice. He too, learns the dead languages, and studies the principles and practice of his art, but those principles involve a knowledge of various abstract sciences, and he is constrained to invoke the aid of anatomy, physiology, chemistry, mineralogy, botany, &c. &c. before he enters upon the practice of his profession. We are speaking of those studies only as they relate to the *professional* qualifications of the student, and of course we are not to be understood as denying either the possession or the importance of other branches of learning to professional men. They, as well as agriculturists and others, in their social and political relations to community, are equally required to discharge the duties of *citizens*; and we hold that all classes should avail themselves of every accomplishment which learning or science can bestow, in aid of the performance of those high duties. But we need not array comparisons or illustrations on the subject: our opinions may be presented at one view. We would give to every one, of whatever pursuit, precisely the education adapted to it—and it should be thorough and perfect in all its branches, or at least so far as any or all the branches related to the peculiar pursuit adopted by the student. It should thus qualify him for the intelligent prosecution of the labors of his life and ensure his complete success. It would render the farmer as illustrious, and certainly as useful, in his sphere, as the profoundest statesman or professor. But the subject is too interesting to be treated satisfactorily in the narrow limits to which we are circumscribed; and we mean to pursue it.—In the meantime, we submit to the board of education, and to the commissioners of common schools, the propriety of early considering the importance of adopting a series of agricultural works, as text books in the schools about to be put in operation under the excellent common school law of the state. They may do incalculable good to the children of Kentucky, which will flow to other generations, and they may render the system far more useful and effective, by seasonably directing their earnest attention to the subject.—*Frankfort, Ky. Farmer.*

Quality of Milk during the process of Milking.—Several large coffee-cups having been successively filled from one cow, till she was quite dry, the following results appeared: great care being taken to weigh the cups to ascertain that they held exactly the same quantity: In every case the quantity of cream was found to increase in proportion as the process of milking advanced. In different cows the proportion varied, but in the greater number the excess of cream in the last cup, as compared with the first, was sixteen to one—in some it was not so considerable:—therefore, as an average, it may be called as ten to twelve to one. The difference in the quality of the two sorts of cream was no less striking: the cream given by the first drawn milk was thin, white, and without consistence, while that furnished by the last was thick, buttery, and of a rich color. The milk remaining in the different cups presented similar differences: that which was drawn first was very poor, blue, and had the appearance of milk and water: that in the last cup was of a yellowish hue, rich, and to the eye and taste, resembled cream rather than milk. It appears, therefore, from these experiments, that if after drawing seven or eight pints from a cow, half a pint remains in the teats, not only almost as much cream will be lost as the seven or eight pints will furnish, but that of the best quality, and which gives the richest taste and color to butter. This fact has been corroborated by chemical experiments, and holds good with respect to goats and asses.—*Blachler's Essay on the Improvement of small Farms.*

[*From the Farmers' Magazine.*]

Old and New Husbandry.

SIR—Glad that my former observations have interested your readers, I am now desirous, with your permission, of further prosecuting my original object, which was to encourage the employment of the poor by the occupiers of land. To this end I wish to explain somewhat more fully the means by which I am enabled to employ nearly half as many more men as are usually employed on the same number of acres, not only, as I think, without loss, but with a fair return of profit.

It may be proper to premise that my farm consists of about 200 acres; comprising 30 of wood, 42 of pasture, the rest arable. Of the arable, 85 acres are of good mixed soil, well adapted to turnips and barley, but not considered equal in value to the best wheat land; the remainder consists partly of a hungry gravel, partly of clay, of very inferior quality.—It is cultivated on the Norfolk, or four-course system.

1. I diligently collect litter of every kind, seaweed, furze, fern, leaves of trees, &c. for bedding my yards, in addition to the straw grown on the land.—In the last 12 months I have brought in about 50 wagon loads of this description; each wagon load gives employment to about three men for a day, the total is therefore 150 days.

2. This increase of litter would avail little or nothing if I did not keep an extra number of live stock, for I observe that many farmers do not even make their straw into good muck. I therefore fat about 40 hogs and four or five head of horned cattle every winter; enough, in short, to consume half my Swedish turnips, which are drawn and carried into the yards for this purpose. The drawing, topping, and carting, together with the time occupied in looking after the stock, may be estimated at one man's employment during the winter months, equal to 150 days.

3. The removal of one-half the turnips would injure the succeeding barley crop, if I did not lay on, at the time of sowing the turnips, an extra quantity of manure, say 25 single horse cart loads per acre, about 10 loads more than the usual allowance. This I am enabled to do, partly by the great quantity of litter in my yards, partly by placing a bottom of earth or chalk under every dung heap, and a thin covering of the same materials over the top. The practice of carting all my dung twice, first from the yards to bottoms prepared in the fields, and then on the land when wanted for use, of course employs many hands, as well as the turning their composts, and mixing the materials together. I believe I do not over rate the number of cart loads filled annually on my farm at 2,400, whereas on the same number of acres, a farmer who moved his dung only once, carrying it immediately from the yard, and at the rate of 10 loads per acre for turnips, the same for wheat, would fill only 600 cart loads annually. The extra 1,800 loads may give about 112 days employment, and the turning of the compost about 20 more; making together 132 days.

4. I have introduced this year the Norfolk practice of dibbling wheat. This occupies two men and six children for 30 days, at the rate of half an acre per man per day. Computing the six children equal to one man, the dibbling gives extra employment of 90 days. The expense is paid in the saving of seed, to say nothing of the increased produce, which is estimated by the best Norfolk farmers at a sack per acre.

5. Extra weeding, throwing ditches, draining, &c. may occupy about 80 days.

Let us now recapitulate—

Collecting litter, ...	150 days.
Feeding stock in yards, ...	150
Carting earth and dung,.....	132
Dibbling wheat,.....	90
Extra weeding, draining, &c....	80
Total,.....	602

At 300 working days in the year, this is equal to two laborers extra, winter and summer, employed on a farm containing only about 120 acres of arable land.

It is not easy to estimate with precision the increased amount of produce which a farmer may expect to obtain in consequence of such an increased outlay in labor; the less so as that increased produce does not make itself felt the first, second, or third year, to the full extent; indeed, I have heard an intelligent farmer say, that he has observed a progressive improvement in his land during no less than *twenty* years, from persisting in a system of high cultivation. I quoted in a former letter the estimate of Von Thaer, which, however, was so disfigured in the printing (owing, I fear, to the badness of my hand writing,) as to be almost unintelligible; I beg leave, therefore, to repeat the statement.

On a farm on 913 *acres of good barley land.*

	Under the old system two crops and a fallow.	Under the improved or alternate system.
Produce in cattle, ...	£210	£1,249
Produce in grain,.....	894	2,030
Gross produce,.....	1,104	3,279
Expenses of cultivation,	537	1,051
Nett produce,.....	567	2,228

The last line comprises rent, profit, interest on capital, tithes and taxes of any description, the object being simply to show the *comparative* results of the two systems of cultivation. The system is not founded on speculative views, but on extensive and accurate observation during a long series of years by a man well acquainted with the practical business of agriculture. Indeed, I may observe in passing, that there is no work in the English language to be compared with Von Thaer's, so far as my knowledge extends. I am not surprised at the low estimation of works on agriculture among practical farmers. Instead of containing, as they ought to do, a digest of all that is necessary to be known by a single competent hand, such works consist, for the most part, of loose collections of suggestions, speculations, experiments, and observations; correct and incorrect, authenticated and unauthenticated; thrown together apparently almost at random, without order or discrimination.

It will be seen, on comparing Von Thaer's numbers, that his estimate of the expenses and produce on the two systems of cultivation respectively is in round numbers as follows:—On the improved system the expense of cultivation is *double;* the gross produce is *triple;* the nett produce is *quadruple.*

This statement, however, being expressed in so general and abstract a form, and resting as it does on the authority of an unknown author, is not likely, I fear, to weigh much with the majority of farmers.—Let me then endeavor to bring the question home to them by a statement of a different kind. I suppose it will hardly be disputed that by means of the system of high cultivation which I have described, a cultivator may expect to get per acre at least one sack* of wheat, one of barley, a quarter of a ton of clover, hay, and three tons of turnips additional. Let us compute the value of these items.

4 bushels of wheat at 56s...		£1	8	0		
4 bushels of barley at 30s...		0	15	0		
¼ ton of hay at 3l.....		0	15	0		
3 tons of turnips at 5s.....		0	15	0		
	4	£3	13	0		
Average per acre,....		0	18	3		
This on 120 acres amounts to					£109	10	0
The labor of the extra hands through the piece at 11s. per week, amounts to....		£57	4	0		
I charge nothing for horse labor, since the carting of dung, litter, &c., is performed at times when the team would otherwise be standing still. But as there is some additional wear and tear of carts and wagons, let us estimate this at		10	0	0		
					67	4	0
Extra profit arising to the occupier,....					£32	6	0

* A sack is four bushels.

The result of this computation, if correct, ought surely to encourage every farmer to be liberal in his expenditure in the article of labor, and if not correct I hope some one of your many correspondents will point out where I am wrong. The actual produce of the present year, in my own case, is as follows:—my wheat, so far as yet threshed, averages from nine to twelve sacks per acre; the last is the produce of a new variety, which proves very prolific. My barley has yielded on an average twelve sacks per acre. I have, however, one field of barley not yet threshed, from which I do not expect to get more than nine sacks per acre, the soil being a poor gravel. The general character of the land I have already described.

I hope these statements and calculations will call forth the observations of some of your able correspondents, in order that my conclusions may be confirmed, if well founded, or corrected, if erroneous; and should they prove sound, as I am willing to believe, I trust they will contribute to promote the more general employment of the poor.

A HAMPSHIRE AGRICULTURIST.

Feb. 8, 1838.

[*From Hitchcock's Re-Examination of the Geology of Mass.*]

Theory of the action of Lime on Soils, Manure, and Vegetation.

The action of lime is threefold; each distinct. 1. It is a *Neutralizer:* 2. a *Decomposer:* 3. a *Converter.* 1. I have already alluded to some acid soils: free phosphoric acid, geic, acetic, and malic acids, also occasionally exist in a free state in soils. Here lime acts as a neutralizer. 2. Soils may contain abundant geates; particularly geate of alumina, the least of all demanded by plants. Long formed and sun-baked, they are scarcely acted on by rain or dew, and are almost useless. Here lime, by decomposing these metallic and earthy geates, forms a combination, which, in its nascent state, is readily dissolved. If the carbonate of lime acts better than the hydrate, it is because, following a well known law, double decomposition is easier than single. If any acid geine exists in the soil, or any free acids, carbonic acid is then liberated; it acts on the geate of lime, supergeates result, and these are easily soluble.

3. The great use of lime is as a *converter;* turning solid and insoluble, nay, I go further, solid vegetable fibre, into soluble vegetable food. Here is the great puzzle, the point where our philosophy seems to leave us; giving us our choice, to refer this action to one of the numerous cases of mysterious '*catalytic*' change, with which we are becoming every day more and more familiar, or to explain the process by referring the whole to *saponification.* I use this word as conveying to you at once what I mean;—but I do not mean to say that the product of lime and vegetable matter is soap; but I cannot make myself more intelligible to a farmer than by saying, this lime makes compounds of vegetable matter, just as it makes soapy compounds of oil and fat. The action of lime on geine I take to be of the same nature, as its action on oils and fat.—It is well established that animal and vegetable oils and fats are converted into acids by the action of alkalies, earths, oxides, and even by vegetable fibre itself. The general law is, that whenever a substance, capable of uniting with the acid of fat or oil, is placed in contact with fat or oil, it determines the production of acid. Now we have seen that alkali produces a similar change on geine; it develops acid properties. I go further, if alkali has converted vegetable oil and geine into acids, I see no reason why a similar action may not be produced by all those substances which act thus on oil. Hence *lime,* earths, and metallic oxides, convert geine into acid: as fast as this takes place, so fast it becomes soluble. Then too the long action of air on insoluble geine, rendering it soluble, is it not analogous to the action of air on oils?—Both evolve in this case, vast volumes of carbonic acid, the oil becomes gelatinous and soluble in alkali; does not a similar change occur in geine? It is possible that during the action of lime on geine, a soluble substance may be produced, bearing the same relation to this process that glycerine does to saponification. These views you will see need to be followed out experimentally. If found tenable, the most signal benefit will result. We place manures on a new foundation, on which great practical results may be erected.

Practical application of the theory of the action of lime.

Taking the preceding principles as our guide, we may lay down a few general principles for the application of marls.

1. Enough ought to be applied to neutralize all the free acids in a soil; which may be known by its ceasing to produce acid plants, such as sorrel and pine.—Generally, however, the amount required for this purpose is small.

2. It will be serviceable to add enough to convert the earthy geates of a soil into geate of lime. The richer a soil is, the greater we may conclude is the quantity of geates which it contains.

3. It will be serviceable to add enough to convert all the insoluble geine and vegetable fibre in a soil into soluble geine. Hence the richer a soil is, and the more manure is added, the more marl will it bear with benefit. Indeed, *there appears to be no danger of adding too much marl, provided a sufficient quantity of manure be also added.* Ignorance of this principle, I apprehend, is the source of most of the failures that have occurred in the use of lime upon soils. Farmers have supposed that its action was like that of common manure, viz. to serve as direct nourishment to the plant; whereas it only *cooks the food,* if I may be allowed the expression, which exists in the soil, or is added along with the lime. In nearly all cases of over marling which I have read of, a fresh supply of manure has been found to be the remedy; which shows the truth of the above principle. Agriculturalists have spread marl alone, or with very little manure, upon land that has been worn out, that is, whose geine has been exhausted; and because such soils have not thereby been recruited, they have inferred that lime was injurious. Without acids, or geine, or geates, or vegetable fibre, to act upon, much excess of lime appears to operate injuriously, so as to diminish, instead of increasing the crop. They have also expected a sudden and surprising increase of fertility: whereas in some cases the chief benefit seems to consist in causing the land to produce for a greater number of years, by preventing the ultimate decomposition and escape of the organic matter. In general, however, it will add also to the yearly product: but those who employ marl or lime in any form, ought to moderate their expectations that they may not be disappointed, and to be satisfied if they can slowly and surely improve their lands, as they most assuredly can do, by this substance, provided they do not expect to accomplish it by the use of lime alone.

Templemoyle Agricultural School.

The Agricultural Seminary of Templemoyle originated at a very numerous meeting of the North-west of Ireland Farming Society at Londonderry, and it was at first intended that it should consist of two establishments, taking Mons. Fellenberg's Institution at Hoffwyll in Switzerland in some degree as the model: the first to be a school affording instruction in every science and accomplishment aimed at by the children of the higher orders; the second for the education of the sons of respectable farmers and tradesmen, in the hope of disseminating the advantages of an improved system of farming with greater certainty, by combining the practice and theory of it in the instruction of those who were afterwards to make agriculture their pursuit. It was hoped that the extended scale of the institution would have allowed of a greater variety of masters and lecturers, and that the profit derived from the superior school would have contributed towards the maintenance of the secondary one; but a short experience convinced the subscribers that such a scheme was impracticable without much larger and more certain funds than they could rely on; they then gave their undivided attention to the agricultural seminary, which through their increasing exertion has attained such eminence as may justly entitle them to look forward with confidence to its increasing usefulness, and to its becoming a model for establishments of a similar nature in other parts of Ireland.

The school and farm of Templemoyle are situated about six miles from Londonderry; about a mile distant from the mail-coach road leading from Londonderry to Newtowlimavady. The house, placed on an eminence, commands an extensive and beautiful view over a rich and highly cultivated country, terminated by Lough Foyle. The base of the hill is occupied by a kitchen and ornamental garden, cultivated by the youths of the establishment, under an experienced gardener. The ground between the garden and house is laid out in beds in which all the different grasses, clovers, &c., are cultivated with the greatest care. The house is in the form an ‖=‖, with range of farming offices behind, containing spacious, lofty and well ventilated school rooms, refectory, dormitories, apartments for the masters, matron, servants, &c.

Each pupil occupies a separate bed; the house can accomodate seventy-six, and the number of pupils amounts to sixty. They receive an excellent education in reading, writing, and arithmetic; book-keeping, mathematics, land-surveying, and geography. This department is managed by an excellent head master and assistant master, both resident in the house. The pupils are so classed that one-half are receiving their education in the house, while the remainder are engaged in the cultivation of a farm of 130 Cunningham or 165 statute acres, in the management of which they are directed by the head farmer, an experienced and clever man, a native of Scotland, who has a skilful ploughman under him. The pupils who are employed one part of the day on the farm, are replaced

by those in the school, so that the education always advances in and out of doors *pari passu*.

The pupils are thus instructed in all the practical parts of farming, and are also several times a week on the theory of agriculture. They are made acquainted with all the properties of different soils, the manures most applicable, and the crops best adapted to each; points in which most of our practical farmers displayed great ignorance. They are also made acquainted with all the numerous varieties of cattle, and their qualities, such as early maturity in some breeds, hardihood in others, and have strongly impressed on them that one of the most essential points in farming, is to select the cattle and the crops best adapted to the situation, soil, &c.

The stables, harness-rooms, cow-houses, winter-feeding houses, piggeries, barn, tool-houses, are arranged in the best manner, and the pupils are required to keep them and their contents in the highest order. A respectable and intelligent matron has the superintendence of the dairy, cooking, and cleaning the house, and the charge of the domestic servants.

In sending a pupil to Templemoyle, it is necessary to have a nomination from one of the shareholders, or from a subscriber of 2*l*. annually. The annual payment for pupils is 10*l*. a year; and for this trifling sum they are found in board, lodging, and washing, and are educated so as to fit them for land-stewards, directing agents, practical farmers, surveyors, schoolmasters, or clerks.

From fifteen to seventeen is the age best suited for entrance at Templemoyle, as three years are quite sufficient to qualify a student possessed of ordinary talents and a knowledge of the rudiments of reading and writing, to occupy any of the above situations.

N. B.—Upwards of two hundred young men, natives of sixteen different counties in Ireland, have passed through or remain in the school. Of these between forty and fifty have been placed in different situations, such as land-stewards, agents, schoolmasters and clerks, or employed on the ordnance survey. Nearly one hundred are now conducting their own or their fathers' farms in a manner very superior to that of olden time; and the accounts of those who have been placed from the seminary are such as to gratify the gentlemen who have its interest at heart, and to convince them that the good seed sown is producing an ample and valuable harvest.

Templemoyle, Oct. 14, 1837.

[It gives us unqualified pleasure to lay before our readers the above gratifying account of an institution so eminently calculated to confer lasting benefits upon the country. We have been long strenuous advocates for the establishment of agricultural schools in all parts of Ireland, feeling assured that they would ultimately be the means of breaking down those absurd prejudices which have been hitherto the most insurmountable obstacles with which agricultural improvement had to contend.]—*Editors* [*British*] *Farmers' Magazine.*

Decomposition or Putrefaction of Vegetables.

All vegetables, when the principle of life has departed from t em, begin spontaneously to be decomposed (to putrify). The elements which enter into the composition of plants, when left entirely to the disposal of their chemical affinities, have a tendency so separate from each other, and form new compounds very different from those which compose the Lving plant. This is termed the "spontaneous decomposition" of vegetables. The substances formed by the new arrangement of the elements of the vegetable are aerial and colourless;—hence the entire disappearance of the vegetable, as if it had been totally annihilated when life ceased to preserve its particles together in the vegetable form.

The compounds formed, when the vegetable dies and putrefaction goes on, are, carbonic acid, water, carbonic oxide, and carburetted hydrogen. The two former are the chief results of the decomposition; the two latter formed more sparingly, and principally when there is not a free supply of oxygen to the substance undergoing decomposition. The carbon and hydrogen of the plant have a constant tendency to unite with oxygen, and form carbonic acid and water. Now there is never present in the vegetable a sufficient supply of oxygen to convert all the carbon into carbonic acid, and all the hydrogen into water; hence, if there be not a sufficient supply of oxygen to produce these compounds presented from external sources, as from the air, the two other matters are formed, one of which (carbonic oxide) requires a less quantity of carbon than the carbonic acid, while the other (carburetted hydrogen) requires no oxygen, consisting of carbon and hydrogen.

In vegetables which decay under water, caburetted hydrogen is abundantly formed; hence arises the gas which is found so plentiful in summer in stagnant waters containing quantities of putrefying vegetables.

The spontaneous decomposition of vegetables goes on most rapidly when they are exposed to the air, kept moist, and preserved at a degree of warmth higher than the usual temperature of the atmosphere. Putrefaction is retarded or almost prevented if the vegetable be dried, so that its own moisture is expelled, carefully excluded from air and moisture, and kept cold. The influence of heat in promoting the decay of vegetables depends upon the repulsive power it possesses, by which it disposes the various elements to assume the gaseous form. Animals and vegetables are frequently found in snow or ice, in a high state of preservation.

Such are the changes which go on in the dead plant. That mysterious agent, Life, is able by its peculiar power, to control and overcome the chemical attractions which tend to produce these changes, and retains these elements in that state of combination best adapted for the performance of their proper functions: at the moment however, in which life ceases to superintend the exercise of these functions, they cease and the chemical attractions, no longer restrained by the vital principle, obtain full sway. The carbon, oxygen, and hydrogen, formerly existing in the state of wood, bark, leaves, fruit, or seeds, obey the laws of chemistry, return to the state of carbonic acid; water or inflammable gas mix with the earth and atmosphere, afford nutriment to new plants, again form leaves, flowers, and all the beautiful and diversified organs of the vegetable creation—again wither and decay, and return to the soil to supply new generations, and continue the same series of unceasing revolutions.—*Chemistry of Nature.*

Application of Marl.

On reading the last No. of the Cabinet I perceive that your readers in the lower part of Delaware and the Eartern shore of Maryland, where the green sand or marl abounds, are desirous of being informed of the best mode of applying it as indicated by the experience of our New-Jersey farmers. It may perhaps save those who are inclined to try it, some trouble and expense to be informed that every known method of application seems to have been resorted to; and that which has been found to answer best, is to use it as a top dressing on sward or grass grounds; the effect is immediate and great, being scarcely to be believed excepting by those who have been spectators of its effects. The quantity applied to an acre of good marl is from six to twenty tons; a bushel weighs about a hundred weight—of course a ton is about twenty bushels; more may be applied without any apprehension of injury, but from twelve to fifteen tons per acre is a good dressing, though some have applied twice that quantity. Spread it evenly over the surface of the grass ground in the fall, winter or spring, or whenever you have most leisure, and when done you need not give yourself any further trouble about it; nature will do the rest, and your reward will be certain and great if your marl be good. Whenever you plough down your grass ground which has been thus marled for corn, or any other crop, you will see the effect of it strikingly exhibited in the subsequent crops. It has frequently increased the fertility of the soil more than ten fold, and some crops are believed to be much improved in quality as well as quantity by its application.

The great weight of the marl causes it to sink in the earth, and it it should be ploughed in on its first application, there is some danger of losing part of the good effects of it, by its being placed too remote from the roots of the plants intended to be nourished by it.

It is now agreed on by all, that the fertiiizing ingredient of this valuable substance is potash, and the benefits derived from its use are directly proportioned to the quantity of it contained in its composition.—*Communicated for the Farmers' Cabinet.*

Notice of an Experimental Farm in France.

BY COL. LE COUTEUR.

It is situated, in a beautiful and fertile country, well wooded and watered, but cultivated by the Breton farmers just as their fathers tilled it 200 years since. The college or experimental farm appears like a garden in a smiling wilderness, so far as culture goes. I rose at four in the morning, in order to witness the whole course of labor in this interesting institution.

There were from 80 to 90 students under the superintendence and tuition of a director, a professor of agriculture and agricultural chemistry, a veterinary surgeon, and an agricultural implement maker. At half past four they took a slight repast, and as the clock struck five, all were employed; some in harnessing the horses and oxen, others in carting out and properly disposing the implements in the field, others set to hoeing, others weeding, some ploughing, some hay making, in a word to all the various labors of the season.

The school is divided into working parties of ten; at the head of each is a steady young man of experience, called the 'decurion,' who directs the work of his party. In all difficult operations, a regular farming laborer is at hand to perform them; but such is the ardor and perseverance of the youths, that they rarely allow any difficulty to arrest their progress. The duty of one 'decury' or ten, is to dress, litter and feed the cattle, with as much regularity as a cavalry corps dress their horses; also to keep the farmyard in order. Thus all, in turn, are made acquainted with every thing connected with a farm, whether in regard to horses, oxen, cows, pigs, or manures. These last are made and husbanded with the greatest care, the mixons being formed of sweepings, leaves, and weeds that had not seeded, in alternate layers with stable manure.

The drainings of the stables and straw-yard, run into a tank, to be pumped out when required as liquid manure, which is in the best, most portable, but least known in this country.

The learned professor M. Donku, who is an admirable practical farmer, as polite and communicative as he is learned, complained that he had not a sufficient quantity of manure. I urged him to burn the underwood and decaying timber of the large adjacent forests, through which wide roads were cut, which would enable him to obtain an inexhaustible supply of ashes the best of all manures either for turnips or wheat; the cartage of ashes being easy, and the quantity required to dress the land not being great; in which he entirely coincided.

At nine all come into their studies, when they write remarks on the various operations of the morning. From eleven to twelve is the breakfast hour. From twelve to three is the time for recreation and study, which embraces for the first class questions of the following nature:—"His farm of 600 acres, one eighth of which is always to be in beet-root, is to be divided into the most eligible rotation of crops; show the most profitable course, and describe the nature and chemical properties of the soil in each field, the proper manures to be applied to them, the quantity of seed required for the crop, its culture by previous ploughings, by after-hoeing or weeding, and the cost and labor, and the probable return!"

The plans of farming given by some of the youths, would have done credit to an experienced farmer, and demonstrated clearly that though theory alone in farming is an absurdity, the combination of the practice with scientific acquirements, will soon operate great melioration in the agricultural world. From three till seven they prosecute their labor in the fields, being eight hours work in the day. They then come in for dinner. At eight the director receives the report, from every decurion, of the day's work of his party of ten. He then orders the work for the ensuing day, giving a concise lecture on the subject when necessary to the culture of any unusal crop. A library of agricultural works is open to the students till bed time, quarter past nine. * * * The crop that appeared to me to be most carefully cultivated, was beet-root in drills, which produced per acre about 750 pounds of sugar, selling at ten pence per lb. as fast as it could be manufactured.

Science of Gardening.—*Continued.*

POTASS.

When wood or any garden plant is burned to ashes, these are found to consist of a considerable portion of the substance termed potash, which was discovered by Sir H. Davy to consist of a metal termed potassium combined with oxygen and water. Different sorts of plants, however, vary very much in the quantity of potass which they contain; aspen and boxwood, for instance, containing only sixty or eighty pounds in every thousand pounds weight, while sunflower, fumitory, and wormwood contain from three hundred and fifty to seven hundred and fifty pounds in every thousand. Sea weeds and plants growing close by the sea shore, instead of potass, yield soda, when they are burnt to ashes.

It may be taken as a general rule, that the herbs yield four or five times, and shrubs two or three times, as much impure potass as trees; while the leaves produce more than the branches, and the branches more than the trunk; and further, that plants, when green and fresh, yield more than when they have been previously dried.

The process by which this is ascertained is not difficult, and consists in weighing the plant before burning; in washing the ashes twice in their own volume of water; in passing the washings through blotting paper; and in evaporating them to dryness. The dry substance thus obtained will be probably pure potass.

The potass is introduced into the system of a plant in the same way as carbon, by being first combined with humic acid, forming humate potass, and then dissolved in water.

LIME.

Like potass, lime has been proved to be composed of a metallic substance termed calcium, united with oxygen. When thus composed, with the addition of other substances, it is usually called quicklime; when united with carbonic acid, it forms chalk, limestone,

marl, and marble; and when united with sulphuric acid, it forms gypsum, or plaster of Paris.

In the proceess of burning vegetables, lime is found in their ashes, but never, I believe, in such quantities as potass, and consequently it is of less use to supply soils with it artificially on this account; but on account of its uniting with humic acid in form of a humate, and of the compound thus formed being readily dissolved in water, it becomes highly useful.

If quicklime, either fresh burnt or slaked, be mixed with moist vegetable substances, however hard and fibrous, it soon destroys their texture and forms a mixture, the greater part of which can be dissolved in water, thus rendering what was previously useless, fit for the food of plants.

On the other hand, it is injurious to mix quicklime with vegetable substances already soluble in water, or with any sort of dung, or other animal manure, lest it should take up too much humic acid.

Lime, however, is more seldom used in gardens than in farms, and this is so far judicious, that garden soil would often, as appears from what has just been said, be thereby injured rather than benefitted.

SUGAR AND GLUTEN.

There are few plants that do not contain sugar, which chemists have shown to be composed of about three parts carbon, four parts oxygen, and eight parts of hydrogen.

It should follow, therefore, that it is not necessary for it to be introduced into the soil in the state of sugar, the constituents being always more or less contained in the water, and most probably combined into sugar after entering the system of a plant. This applies also to starch, which is composed on the same principles, and may indeed be converted into sugar, as was lately discovered: and gluten differs only in containing nitrogen, in addition to the carbon, oxygen, and hydrogen.

In a word, all substances of this kind which can be discovered in the soil, or in the water diffused through it, may be resolved into water, carbon, and nitrogen; and hence it is of less consequence for our present purpose to notice separately every compound that might be enumerated.

RECAPITULATION, AND PROOF FROM THE SAP.

It hence appears, that the chief food of plants is carbonic acid gas, atmospheric air, and the humates of potass and lime mixed with water, and presented to the spongelets or suckers at the tips of the root fibres, to be thence carried into the interior of the plants. The examination of the sap, as it rises from the root into the inner bark of a tree, confirms the truth of these statements.

This sap is usually found to be a clear fluid, of a pleasant taste, readily fermenting, and, in that case, giving out, at first carbonic acid gas, and afterwards some azote. The chief portion of the sap is water, and it only differs from the moisture of the soil by acquiring in its passage upwards a portion of thicker fluid, which probably acts a part similar to the saliva of animals, mixed with the food in chewing, or to the digestive fluid in the animal stomach. By means of this, the sap becomes thicker the higher it rises. M. Biot, of the French Institute, is at present, 1833, engaged in experiments which bid fair to elucidate this important subject. His tests of the substances contained in the sap are made by the polarisation of light.

Young Men's Department.

Hints to Young Farmers—No. IX.

DO NOT GET ABOVE YOUR BUSINESS.

One of the most fatal errors which young men are apt to commit, is, when they have acquired the means of a comfortable independence, and are established in doing well enough, *to get above their business*. They are apt to relax in those labors, or in the supervision of them, which led to success—or to become dissatisfied with their moderate but certain gains, and seek to better their fortunes, and to elevate their standing, by embarking in some new business, to which they are yet strangers.

It should be your aim, first, to make yourselves practically acquainted with the best modes of performing every operation of the farm; and, secondly, constantly to superintend and direct those you employ in these operations. There is hardly any business in life, in which success does not materially depend upon the practical knowledge and rigid supervision of the master. If you would have your work done, *see* that it is done—if you would have it well done, *lead* in its performance. It will impair neither your physical nor intellectual powers, but invigorate and strengthen both. There are very few sufficiently trust-worthy and intelligent, to be charged with the entire management of a business in which they may be considered as mere hirelings. And unless the master is a proficient in the business he is carrying on, in all its minutiæ—unless he knows how every operation *should* be conducted—the *time* it will require to perform it, and see that it is *done well*—he is subject to constant impositions, disappointments and losses. Hence we see, that not only in farming, but in most other employments, unless a man has practical knowledge, as well as theoretical, in the business he carries on, he is far less likely to succeed, than others who possess this practical knowledge. A man may be made to comprehend, very well, the plan and construction of a house, or the principle of amputating a limb of the human frame; yet, until his hand is practised in carpentry, or in surgical operations, we should hardly venture to trust him to build our house or to cut off our leg. These remarks apply to the minute, as well as to the more enlarged operations of the farm. If your workmen have confidence in your knowledge and judgment, and are aware of your critical supervision of your affairs, they will labor cheerfully and diligently, respect your authority and carry out your views of improvement. Hence, we repeat, make yourselves practically acquainted with every operation in farming—though you do not practise it after you have acquired that knowledge—be the manager of your own affairs as far as possible—avoid the temptation to change, to indolence and to speculation, and be assured you will not fail to enjoy, in a large measure, the substantial comforts and pleasures of life. And having realized these blessings yourselves, take care to secure them to your children, by inculcating and establishing in them, the principles and habits which have led to your individual success.

Another common propensity to error, in the farmer, is to ape the follies, the fashions and the extravagance, in dress, equipage and supernumerary servants, of what are termed the higher classes in society—which seldom redound either to our comfort, to our rational gratification, or to our respectability in life. An old veteran of the revolution, who had acquired a fortune by prudent industry, once remarked to us, that to gratify the feelings of a young family, he set up a coach. He was obliged, he said, to have horses and harness, and household furniture to correspond. His coachman required an extra maid to wait upon him, and the maid required a scullion to wait upon her; and he found, that instead of being master, and enjoying his quiet, he became virtually the servant to the coachman, maid and boy. So that after spending a thousand dollars a year, barely upon his coach establishment, he sold out, dismissed his supernumeraries, and returned to his Dearborn wagon and horse, to the great relief of both his mind and his purse. It is commendable to endeavor to multiply around us the comforts, and even the innocent delicacies and elegancies of life; yet it is folly to adopt habits, either from ostentation, or a spirit of foolish rivalship, which are not adapted to our employments or our means, and are not calculated to make us either wiser or happier. Gentility, that is, politeness of manners, and easy, graceful behaviour, may be cultivated in the country as well as in the city—as well upon the farm as behind the counter. It is neither the coach, nor the gay dress, nor the ostentatious display, nor the title, that makes the gentleman, nor insures happiness. For, as Burns sings, though

> "The king can make a better knight,
> A marquis, duke and a' that,
> * * *
> The pith of sense, and pride of worth,
> Are grander far than a' that."

Chemical Catechism—Chapter III.

OF CALORIC.

What is heat?

Heat is the well known sensation which we perceive on touching any substance whose temperature is superior to that of the human body.

What name is given to the matter of heat?(a)

Chemists have agreed to call the matter of heat *caloric*, in order to distinguish it from the sensation which this matter produces.(*b*)

What are the principal uses of caloric?(c)

Caloric is every where indispensable to the existence of man. "It is with fire that, in every country, he prepares his food, that he dissolves metals, vitrifies rocks, hardens clay, softens iron, and gives to all the productions of the earth the forms and combinations which his necessities require."

What are the sources of caloric?

There are six sources from whence we procure caloric, viz. from the sun's rays, by combustion, by percussion, by friction, by the mixture of different substances, and by means of electricity and galvanism.

Which of these is the principal source of caloric?

The sun is the chief, and, probably, the original fountain which furnishes the earth with a regular supply, and renders it capable of supporting the animal and vegetable creations.(*d*)

How is caloric furnished by combustion?

The oxygen gas of the atmosphere is *decomposed* by combustion; and caloric, one of its component parts, is set at liberty.

How is caloric produced by percussion?

The heat produced by percussion is generally occasioned by the *compression* of the particles of the body, which compression forces out a portion of its latent caloric.(*e*)

How is caloric produced by friction?

It is not known how friction produces caloric,(*f*) unless we suppose it to be a succession of percussions.

In what way can heat be produced by means of electricity or galvanism?

By the discharge of an electrical battery, or by the galvanic apparatus, a more intense degree of caloric may be obtained than by any other means whatever.

How is caloric produced by mixture?

When heat is produced by the mixture of two or more substances, it is owing to the fluid part of the mixture taking a more solid form; for neither water nor any other fluid can acquire an increase of density without giving out a portion of its latent caloric. (*g*)

You speak of latent caloric; is there any difference in the nature of caloric?

No: we have reason to believe that caloric is uniform in its nature; but this term is necessary because there exist in all bodies two portions of caloric, very distinct from each other.(*h*)

How are these two portions of caloric distinguished?

The one is called *sensible* heat, or free caloric; the other *latent* heat, or combined caloric.

What do you mean by free or sensible caloric?

Sensible caloric is the matter of heat disengaged from other bodies, or, if united, not chemically united with them.

What is latent caloric?

Latent caloric is that portion of the matter of heat which makes no *sensible* addition to the temperature of the bodies in which it exists.

What substances contain latent caloric?

Caloric in a latent state exists in all substances that we are acquainted with.(*i*)

Do all substances contain the same quantity of latent caloric?

No: caloric combines with different substances (*j*) in very different proportions; and for this reason one body is said to have a greater *capacity* for caloric than another.

Is this capacity for caloric uniformly the same in the same bodies?

The same bodies have at all times the same capacity for caloric, unless some change takes place in the state of those bodies.

Can you adduce instances of a change of this kind?

When gaseous substances become liquid, or liquid substances become solid, they lose in a great measure their capacity for caloric: accordingly, when solid bodies become liquid or gaseous, their capacity for caloric is proportionately increased.(*k*)

How does this property of bodies operate?

Whenever a body has its capacity for caloric thus increased, it requires a larger portion of the matter of heat to raise it to a given temperature, than another body does which has a less capacity for caloric.

Can you exemplify this curious property of matter?

If equal quantities by weight, of water and mercury, cooled down to the same point, be afterwards separately heated to the heat of boiling water, the water will be found to have required more than three times the quantity of caloric that the mercury did to bring it to that temperuture.

What term is made use of to denote the quantity of caloric thus required?

The portion of caloric necessary to raise a body to any given temperature is called the *specific* caloric of that body?

Is there any method of ascertaining the specific caloric of different bodies, and comparing the relative capacity of each for caloric?

An instrument called a *calorimeter* is used for this purpose. The substances to be tried are heated to the same temperature, and then placed in this machine surrounded with ice.(*l*) By observing how much ice each of them melts in cooling down to a given point, the specific caloric which each of them contained is determined.

What do you call the instrument which is in common use to measure the temperature of bodies?

It is called a thermometer. (*m*) It consists of a glass tube containing a portion of mercury, with a graduated plate annexed to it. The tube is hermetically sealed, to preserve the metal from the pressure of the atmosphere.

Do you understand how a thermometer is affected by the temperature of bodies?

When a thermometer is brought in contact with any substance, the mercury expands or contracts till it acquires the same temperature,(*n*) and the height

at which the mercury then stands in the tube, indicates the exact temperature of the substance to which it has been applied.

Will the thermometer show the exact quantity of caloric in all bodies?

No; it will not show that portion which is latent, or chemically combined with any body: for instance, fluids require a certain portion of caloric to keep them in a state of fluidity; which portion is not indicated by the thermometer.

Is the thermometer, then, of no use in ascertaining the temperature of fluids?

Yes: all fluids operate upon the thermometer in the same manner as solids; for, whatever sensible caloric be contained in any liquid, that portion is accurately shown by the thermometer.

What do you call that portion of caloric which is a necessary part of fluids?

It is called the caloric of fluidity; but different fluids require different portions of it to preserve them in the state of fluids.

What are the effects of caloric upon bodies?

The *general* effects of caloric are, to increase the bulk of the substances with which it unites, and to render them specifically lighter than they were before; but in whatever quantity it is accumulated in bodies, it never adds to their absolute weight.

What are the PARTICULAR *effects of caloric on bodies?*

It favors the solution of salts, and promotes the union of many substances. In other cases it serves to separate bodies already united,(*o*) so that in the hands of chemists it is the most useful and powerful agent we are acquainted with.

Can you recollect any other particular effect that caloric has upon bodies?

It is the cause of fluidity in all substances which are capable of becoming fluid, from the heaviest metal to the lightest gas.

How does caloric act upon hard bodies to convert them into fluids?

It insinuates itself among their particles, and invariably separates them in some measure from each other. Thus, ice is converted into water, and by a further portion of caloric into steam.(*p*)

How are these substances distinguished which are capable of being thus rendered fluid by caloric?

We have reason to believe that every solid substance on the face of the earth might be converted to a fluid, or even a gas, were it submitted to the action of a very high temperature, in peculiar circumstances.

You say the sun is the great source of caloric; how is caloric transmitted from the sun to us?

Caloric is transmitted to us accompanied by light: both are perpetually thrown off from that immense body with astonishing velocity in every direction.

If caloric passes with such velocity, how is it retained by those substances which receive it?

It is retained by its affinity for those bodies, or rather, their mutual affinity for each other.

Do bodies in general possess a very strong chemical affinity(q) for caloric?

No: it is one of the weakest of all known affinities, which is evident from the facility with which heated bodies part with their caloric to all surrounding bodies.

Is this universally the case?

Yes; it seems to be one of the laws of nature, that heated bodies should give out *part* of their free caloric to the neighboring bodies at a lower temperature, till the whole become of an equal degree of temperature.

Give me an instance of the operation of this law of nature.

When the temperature of the atmosphere is reduced below 32°, water gives out its superabundant caloric by degrees, till at length the cold atmosphere robs it of its caloric of fluidity also, and it becomes ice.

If water be changed into ice by parting with its caloric, how comes it to pass that ice swims upon the surface of water?

Because, by the change which it undergoes, it becomes specifically lighter than the subjacent water.

Did you not say that all substances become more dense by the loss of caloric?

They usually do; but the freezing of water is a striking *exception* to this general law of nature, and is a memorable instance of the wisdom and provident care of the Almighty, when he established the laws of the universe.

NOTES.

(a) The sensation of heat and cold arises from the tendency which caloric has to diffuse itself equally amongst all substances that come in contact with it. If the hand be put upon a hot body, part of the caloric leaves the hot body, and enters the hand; this produces the sensation of *heat*. On the contrary, if the hand be put upon a cold body, part of the caloric contained in the hand leaves the hand to unite with the cold body: this produces the sensation of *cold*.

(b) In order to give precision to chemical language, it was necessary to find a term to distinguish the matter of heat from its effect; for whenever caloric becomes fixed in a body, it loses its property of affording heat. Nothing can be more evident than that caloric may exist in many substances, without producing any of the effects which arise from the agency of fire.

(c) Many of the uses of fire will immediately occur to every individual, whenever the importance of this subtle fluid is alluded to; though perhaps the wisdom of the Deity, in giving the use of it to man only, has not been often noticed. Why has this powerful agent been solely entrusted to man? Why was every fowl of heaven, and every beast of the field, impressed with an unconquerable dread of approaching it? If it were at the disposal of animals, which of our possessions, or even of our lives, would be safe for a single moment?

(d) According to the laws of nature, animal and vegetable life are both very much influenced by the temperature in which they exist; we therefore find different kinds of vegetables, and a different race of animals, appropriated to the different climates of the earth.

That caloric is as necessary for the support of vegetable as for that of animal life, may be proved by direct experiment. If, in the midst of winter, a hole be bored in a tree, and a thermometer be put into it, it will be seen that the tree is many degrees warmer than the atmosphere.

(e) As evaporation produces cold, condensation always occasions heat; that is, caloric is always evolved from those bodies which have undergone any degree of condensation. In one case caloric is absorbed; in the other it is set at liberty.

By the collision of flint and steel, so much caloric is disengaged, that the metallic particles which are struck off are actually melted thereby. This is evident from their being always found in a spherical form:

(f) Instances have occurred where whole forests have been burnt down, by fires kindled from the violent friction of the branches against each other by the wind.

(g) Sulphuric acid and water experience this condensation by mixture, which is proved by the measure of the fluids, before and afterwards, and by the heat that is evolved. If four parts of the former be mixed with one of the latter, the mixed fluids will quickly acquire a temperature higher than that of boiling water. It is necessary to be cautious in making this experiment.

If iron filings and sulphur be mixed into a paste with water, a sulphuret of iron will be formed, which decomposes the water and absorbs oxygen so rapidly that the mixture takes fire, even though it be buried under ground.

Mixture does not uniformly produce heat. The mixture of some substances produces an intense cold. But the cause of both effects is easily explained. Whenever substances become more condensed by mixture, heat is evolved; when they expand, cold is produced; or, in other words, the compound has a greater or less capacity for caloric than the separate ingredients. The mixture of crystalized muriate of lime and snow produces the greatest degree of cold yet known.

(h) How the same substance may exist in a body in two distinct states, may easily be explained by the familiar example of a piece of common bread which has been dipped in water. This bread will contain two portions of water very distinct; one of them is in a state of combination, and forms a constituent part of the bread; the other is only interposed between the particles of the bread, and may again be forced out by pressure.

(i) Caloric pervades all bodies; this is not the case with any other substance we know of—not even light. It lies hid in every thing around us. It is a substance which we are ever in want of; it is therefore deposited on every side, and is ready for every exigency.

(j) Caloric, as it penetrates bodies, frequently forms a chemical combination with them, and becomes essential to their composition. This is always the case when a solid is converted to a liquid, or when a liquid passes to a gaseous state. But if caloric be superadded to a body when it is in a state of saturation, it merely traverses its surface, and passes from it, in the form of sensible heat, to some of the adjacent bodies.

(k) The freezing of water and the cooling of melted lead, may be adduced as familiar examples of the former; and the absorption of caloric in the melting of salts will sufficiently exemplify the latter. By the solution of some salts, water may be deprived of so large a portion of its caloric as to be frozen in the midst of summer.

When water is poured upon dry pulverized plaster of Paris, in order to form cornices for rooms, great heat is produced by the mixture. This is owing to the water giving out its caloric of fluidity as it becomes solidified in the plaster.

Whenever caloric becomes active, it produces heat; when it passes into a latent state, it produces cold.

(l) Ice has the property of absorbing all the caloric with which it comes in contact, and communicates no part of it to the surrounding bodies till the whole of the ice is melted: therefore the specific caloric of bodies may be easily be calculated by its means.

(m) Thermometers are made by putting mercury into small glass tubes with bulbs, and heating these bulbs till the mercury boils. This ebullition forces out the air, and the tubes are hermetically sealed while the mercury is boiling; which preserves the vacuum. They are afterwards graduated by a correct scale.

(n) The absolute necessity there was for an instrument of this kind may be shown by the following simple experiment: If the bulb of a thermometer be immersed in a mixture of snow and common salt, the mercury will fall to at least 32° below the freezing point of water; and if the instrument be then removed from that mixture and put simply into a mass of snow, the mercury will be so much heated by the change, as to rise 32°; so that snow which appears to the hand to be totally devoid of all heat, contains sufficient to raise the thermometer many degrees.

(o) Caloric also promotes the decomposition of bodies, by reason of its counteracting the attraction of cohesion which exists in all bodies.

(p) In India and China the wealthy have their rooms open on all sides, the roof being supported on pillars, and the intervals hung with curtains. Servants without doors scatter water on these curtains continually: its evaporation absorbs a vast deal of heat, and makes the apartments cool and refreshing.

(q) Before a youth can have an accurate idea of chemical attraction, the nature of philosophical attraction should be explained to him, by means of a magnet and iron filings; by globules of water, of mercury, &c.

"What do you teach the girl?" asked Maltravers of the school-master. "That God made her, and that he loves good girls, and will watch over them." "What else?" "That the Devil runs away with bad girls, and"——"Stop there: never mind the devil yet awhile. Let her first learn to do good, that God may love her; the rest will follow. I would rather make people religious through their better feelings, than through their worst. We can do without the devil at present."—*Bulwer.*

There is nearly always something of nature's own gentility in every young woman, (except, indeed, when they get together and fall a *giggling*.) A vulgar boy requires, heaven knows what assiduity, to move three steps, I do not say like a gentleman, but like a body that has a soul in it; but give the least advantage of society or tuition to a peasant girl, and a hundred to one, but she will glide into refinement, before the boy can make a bow without upsetting the table.—*Ib.*

*Moneys received during the last month, in sums of five dollars and over. The total receipts are included from post-offices marked with an asterisk.**

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*Augusta,	N. J. 10	*Mendon,	Illi. 24
Belmont,	Va. 5	Massena, St. Law.	5
*Baltimore,	Md. 93	*Meadville,	Pa. 11
Bennington,	Vt. 13	Maumee city,	O. 7
*Belvidere,	N. J. 22	Milwood,	Va. 11
*Bladensburg,	Md. 17	*Norfolk,	" 36
Clinton,	Geo. 5	*New-York city,	136
Champlain, Clin.	5	New-Haven,	Ct. 6
Clarkstown, Roch.	13	Newtown,	Ct. 6
*Cambridge,	Md. 27	*Nashville,	Tenn. 119
*Cecilton,	" 17	Niagara Falls, Niag.	8
Cokesburgh,	S. C. 22	*New Brunswick,	N. J. 32
*Chicago,	Ill. 13	*Oak Hill, Gr.	8
*Carrolton,	" 22	*Oak Forest.	N. C. 18
*Cooperstown, Ots.	20	*Orange C. H.	Va. 24
Cartersville,	Va. 5	Petersburgh,	Ia. 11
Detroit,	Mich. 5	Piscataway,	Md. 6
Deckertown,	N. J. 11	*Princess Anne,	Md. 60
East Granby,	Ct. 5	*Philadelphia,	Pa. 104
East Bethel,	Me. 6	Quincy,	Ill. 9
Erie,	Pa. 5	*Richmond, Richmond,	31
*Fulton, Ono.	12	*Richmond,	Va. 95
Franklin Centre,	Miss. 5	*Rockville,	Md. 11
*Flushing, Queens,	19	*Shrewsbury,	N. J. 42
Gerard,	Pa. 5	Stone Ridge, Uls.	11
Grafton,	Vt. 13	Scull Shoals,	Geo. 41
Hillsboro,	Va. 5	*Stroudsburgh,	Pa. 18
*Hagerstown,	Md. 19	*Smyrna Del.	23
Henderson,	Ky. 11	Sandersfield,	Miss. 5
*Hancock,	Md. 16	Sag Harbor, Suff.	11
Hartford,	Ky. 5	Shawangunk,	N. Y. 5
*Hartford,	Ct. 24	*Steubenville,	O. 30
*Huntington, Suff.	30	Schoolcraft,	Mich. 6
*Johnson's Springs,	Va. 44	Springville,	N. Y. 6
*Knoxville,	Tenn. 31	*Salem,	Ia. 22
Kanawha C. H.	Va. 10	*Terrahaute,	" 25
*Keene,	N. H. 30	Tamworth,	N. H. 6
Kingsville,	Md. 5	*Vincennes,	Ia. 11
*Luray,	Va. 17	West Chautauque,	Clin. 13
*Lanark,	N. C. 16	White Creek, Col.	11
Low Hill,	Va. 5	Washington city,	D. Col. 53
Lake C. H.	Ia. 11	Washington,	Ill. 6
*Middle Granville,	Wash. 18	*Warsaw,	Va. 22

PRICE CURRENT.

ARTICLES.		New-York. June 16.	Boston. June 11.	Philadelphia June 12.	Baltimore. June 11.
Beans, white,	per bush.	1 25.. 1 30	1 25.. 1 75	1 00.. 1 12	1 00.. 1 10
Beef,	cwt.	8 00.. 11 00	8 00.. 8 50	7 00.. 9 00	10 00.. 12 00
Bacon, western,	lb.	10..	11.. 12	8 00.. 10	12.. 13
Butter, fresh,	lb.	18.. 20	20.. 25	14..	20.. 25
Cheese,	lb.	7.. 9	8.. 9	9.. 10	11.. 12
Cotton, best,	lb.	9¼.. 12	9.. 13	11.. 12	11.. 12
Flour, best,	bbl.	7 50.. 8 25	8 00.. 8 25	7 87.. 8 00	10 00.. 10 50
Grain—Wheat,	bush.	1 02.. 1 03	1 05.. 1 10	1 00.. 1 02	1 00.. 1 02
Rye,	bush.	1 55.. 1 62	1 46.. 1 50	1 37.. 1 40	1 35.. 1 37
Oats,	bush.	46.. 48	48.. 49	95.. 97	33.. 34
Corn,	bush.	78.. 80	76.. 80	65.. 70	60.. 71
Hams, pork,	lb.	10.. 12	11.. 12	10.. 12	12.. 13
Pork, in bags,	cwt.	.....	.....	.....	.....
Seeds—Red Clover,	bush	12 00..13 00	10 00..11 00	6 75.. 7	7..
Timothy,	bush.	3.. 4	2 63.. 3 00	2 50.. 3	2 50.. 3
Wool—Saxony, fleece,	lb.	45.. 50	52.. 57	48.. 50	50.. 55
Merino,	lb.	37.. 38	48.. 50	45.. 50	40.. 45
Tub,	lb.	32.. 36	33.. 35	33.. 38	25.. 30
1-4 and com.	lb.	.....	.....	.....	.....
Sheep,	head.	.45	3 25.. 3 50	.38	2 50.. 3
Cows and Calves,			30.. 37	20..	35.. 46

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